8-2004

The Portable Particular: An Integral Theory of Place

Arthur Paul Butts
University of Tennessee - Knoxville

To the Graduate Council:

I am submitting herewith a thesis written by Arthur Paul Butts entitled "The Portable Particular: An Integral Theory of Place." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.

Mark DeKay, Major Professor

We have read this thesis and recommend its acceptance:

Jon Coddington, Scott Wall

Accepted for the Council:
Dixie L. Thompson

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

I am submitting herewith a thesis written by Arthur Paul Butts entitled "The Portable Particular: An Integral Theory of Place." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.

Mark DeKay
Major Professor

We have read this thesis
and recommend its acceptance:

Jon Coddington

Scott Wall

Acceptance for the Council:

Anne Mayhew
Vice Provost and Dean of Graduate Studies

(Original signatures are on file with official student records.)

THE PORTABLE PARTICULAR:

An Integral Theory of Place

A Thesis Presented for the
Master of Architecture Degree

The University of Tennessee, Knoxville

Arthur Paul Butts

August 2004

ABSTRACT

"Architecture [that brings man and nature together in a 'higher unity'] is likely to alter with the region in which it sends down roots…still it is open in the direction of universality."
-Tadao Ando

Tadao Ando's statement takes a step toward addressing the inherent paradox of the theory of critical regionalism: How to create architecture that is both universal and regional? In other words, how to create architecture that is both portable and particular?

The theory of critical regionalism evolved as a reaction to the architecture of the International Style. With an onslaught of International Style buildings beginning in the 1930s, the importance of creating a connection between building and site was lost. Ian McHarg states: "Architects since the outset of Modern architecture have been anti-ecological…the International Style proclaimed that modern buildings are all coequally suitable for all people, all places and all times" (Kelbaugh, 67). This architecture was not particular. Critical regionalism, however, is a call for a celebration of cultural differences, as well as a participation in the technological advancements emerging everyday.

According to Martin Heidegger, *dwelling,* in both a physical and psychological sense, means to be at peace in a protected place. It is necessary for an individual to be able to identify with his or her surroundings in order to fully dwell. Christian Norberg-Schulz believes that this act is not possible without the psychological functions of *identification* and *orientation*, two things that, if not developed, will lead to a feeling of being lost and eventually fear. Critical regionalism attempts to avoid this problem by creating architecture specific to its location.

Additionally, a concern for more energy-efficient and environmentally friendly buildings is emerging as a primary architectural issue. The advent of climate controlled buildings diminished the importance of building in a way that respected the natural forces of a site. Sustainable design can re-connect the natural and built environments by creating an ecologically fit building.

Sustainable Design can help to re-establish the relationship between the natural and built environments. Critical regionalism can help to re-establish the relationship between the built environment and the individual. A holistic architecture, however, needs to establish a relationship between the natural environment, the built environment, and the individual. This thesis proposes that an Integral Theory of Place will establish this tripartite relationship by combining the theory of critical regionalism with the practice of sustainable design. In doing so, it addresses both the objective and subjective aspects of design, i.e. the building's form in relation to the climate, personal experience, and cultural meaning in the built environment. Conceived as a pattern of design, an Integral Theory of Place is portable by nature. It provides the particulars of the portable, but not the specifics of the particular. What is particular is the emergent architecture. An Integral Theory of Place will thus lead to a holistic design that is environmentally and culturally fit to its place.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1 CAUSES OF CRITICAL REGIONALISM

"Architects since the outset of Modern architecture have been anti-ecological...the International Style proclaimed that modern buildings are all coequally suitable for all people, all places, and all times."
-Ian McHarg

Modernism

The intention of the Modernist movement can be described as a desire to exhibit technological progress by utilizing a "rational and empirical methodology" (Kelbaugh, 61). The 1932 Museum of Modern Art (MoMA) exhibition, *The International Style*, is a prime example of how this belief is represented in architecture. The exhibition, supervised by Henry-Russell Hitchcock and Philip Johnson, classifies Modernist buildings from around the world under the category of the "International Style." It is, however, a purely aesthetic classification, neglecting the respective buildings' responses to their site conditions.

The Modernist building, according to Colin Rowe, is "an icon of change, an icon of technology, and icon of good society, an icon of the future" (Kelbaugh, 60). The buildings of the International Style were object buildings that had no desire to fit into an existing urban fabric. When this is coupled with the 1932 MoMA exhibition, what results is the random and arbitrary appearance of "International Style" buildings all over the globe. This process gains even more speed during the post-World War II period when it is adopted by large corporations because of its purely functionalist appearance, which emanates efficiency, economy, and progress. The problem, however, is found in the lack of commitment to place, context, history, and other traits that are unique to both place and time. Figure 1.1 illustrates this flaw with the siting of a small office building next to an existing residence in Flagstaff, Arizona. The

Figure 1.1 - ***A Lack of Concern.***

lack of concern for context, place, and climate could not be better illustrated.

The advocates of Modernism, however, cause its eventual decline. The standardization and mass production of products (signs of the Industrial Revolution) lead to an excess of available products, all of which were relatively inexpensive. More affordable products result in cities, towns, and buildings having an overwhelming "visual variety" that play a major role in the elimination of regional distinctions (Kelbaugh, 62).

Postmodernism

Although Modernism attempted to be an international movement that eliminated national differences, its "single-minded orthodoxy" was eventually "undermined by pluralism and diversity" (Kelbaugh, 68). Postmodernism was an attempt to celebrate this variety. It counters the functional and rational approach of Modernism by using a "pluralist array of attitudes-…historicism, contextualism, neoclassicism, and neotraditionalism" (Kelbaugh, 63). Postmodernism thus opened the floodgates that Modernism closed, and the historical and architectural contexts become paramount concerns once again.

Like Modernism, it is the intention and desire in Postmodernism that cause its downfall. In reviving historicism, pluralism, and eclecticism, the appearance of a superficial architecture resulted that was lacking in meaning and place-connection. Technological progress is turned a cold shoulder and, again, the characteristics that provide uniqueness for a place are erased.

CHAPTER 2 CRITICAL REGIONALISM

"Critical Regionalism is a term invented by architects that means thinking regionally in ways that are wary and sentimental. It guards against the mindless nostalgia for traditional architecture to which regionalism has been prone in the past...Critical Regionalism is actually more of an attitude than a theory. It is an attitude that celebrates and delights in what is different about a place."

-Douglas Kelbaugh

The Evolution of the Theory

The theory of critical regionalism developed during the late 1970s as a counter to the placeless architecture of Modernism's International Style. Originally coined by Alexander Tzonis and Liane Lefaivre, the theory was further developed by Kenneth Frampton as a means of resistance against the commodification of the built environment.

Applied in a reactive manner, critical regionalism opposes the forces of "technophilia and bureauphilia" the architects of the time perceive as destroying the ecological and the natural equilibrium in the urban and natural environment (Tzonis, 1994, 78). The new global economy, and the consequent globalization of architecture, were destroying the characteristics and peculiarities that lend to the uniqueness of a place. Critical regionalism is the means to counteract these forces, as well as a means to celebrate cultural differences. Opposing the universalizing forces and celebrating cultural differences will ultimately lead to the forging of a local identity.

Critical regionalists believe in walking that fine line between isolation from the outside world and total elimination of the unique qualities of a region. Critical regionalists want to participate in the new world economy, but not to the extent that cultural differentiations are lost. Thus the paradox of the

theory of critical regionalism: How to be "regionalist in a world that in increasingly becoming one global economically and technologically interdependent whole?" (Tzonis & Lefaivre, 1996, 484).

Alexander Tzonis & Liane Lefaivre

Tzonis and Lefaivre's critical regionalism has a commitment to "placeness" and the use of regional architectural elements to confront a universal architecture (Tzonis & Lefaivre, 1996, 486). The use of these regional design elements, however, is solely for their ability to act as place defining elements. They should not be used as they had been in the past, but should rather be re-interpretated and utilized in a new way. This process of *defamiliarization* is one of the main ways this regionalism differs from past regionalism (Figure 2.1). Tzonis states: "Critical Regionalism is interested in specific elements from the region, those that have acted as agents of contact and community, the place-defining elements, and incorporates them strangely, rather than familiarly, it makes them appear strange, distant, difficult, even disturbing" (Tzonis, 2001, 8). As opposed to Romantic Regionalism, which uses these regional elements in a "familiar" way, critical regionalism desires confrontation with, and contemplation by, the viewers. By forcing a dialogue between the viewer and the architecture, questions will arise in the mind of the viewer "about the legitimacy of the very regionalist tradition to which they belong" (Tzonis, 1996, 488).

Figure 2.1 - *Renzo Piano's Rue de Meaux, Paris, France.*

One of the most important aspects of Tzonis and Lefaivre's critical regionalism is the importance placed on the organization of the building to encourage human interaction.

The idea of personal contact and community was lost with the onslaught of the International Style building as an object in space. Tadao Ando's Rokko Housing Project (Figure 2.2) is a prime example of how to effectively remedy this. The overall design of the building complex preserves places that encourage human interaction. Additionally, mass production and standardization, combined with poor urban living conditions culminate with the development of the planned suburb, which is seen as an opportunity for cleaner living and more personal space. The private life becomes paramount, and social interaction at a communal scale falls by the wayside. Tzonis and Lefaivre want to reclaim the importance of community as one method of forging a local identity. Thus by viewing the site from a "socio-economical perspective," rather than as an icon of "*Heimat*," critical regionalism is embracing the "quality of social contact" (Tzonis, 1994, 79).

Figure 2.2 - *Tadao Ando's Rokko Housing Project, Kobe, Japan.*

Unlike past regionalisms, critical regionalism is concerned with local participation on the global scale. Past regionalisms are driven by a desire to gain independence from all other groups and/or foreign countries imposing foreign law. The Picturesque Regionalists during the eighteenth century, for example, used local elements as a sign of independence from foreign rule. In other words, these elements are both elements of liberation, as well as elements of identity. Thus, Picturesque Regionalists wanted to cut all ties with anything foreign. Critical regionalism, however, seeks to neither liberate nor isolate: "Critical Regionalism…in contrast to previous phases of regionalism, does not support the emancipation of a regional group nor does it set up one group against another. It tries to forge the identity of a 'global group' in opposition to 'them,' 'them' being the alien occupation army of technocracy and bureaucracy imposing the illegitimate rule of anomie and

atopy" (Tzonis & Lefaivre, 1996, 489). For Tzonis and Lefaivre, critical regionalism is an act of resistance to the *globalizing trend* that results in architecture lacking in purpose. The most appropriate means of resistance is the development of a local identity within individual regions. These "identities" will not have a global presence or influence when acting alone, but, when united, can effectively resist the globalization of architecture.

Tzonis and Lefaivre also call for the use of local building materials and construction techniques as another method of forging a local identity. This does not imply, however, a regression to antiquated methods. On the contrary, "…the preference for local materials does not exclude technological innovation and experimentation, as long as these things are not promoted as the goals and do not result in a socio-environmental disruptive impact" (Tzonis, 1994, 79). With the Industrial Revolution, the International Style and the technology of mass production, architecture had the opportunity to experiment with new materials and building technologies. Unfortunately, this lead to buildings serving as "signs" of what was possible with the new materials and methods. The program and occupants became secondary because technological innovation and experimentation were seen as the ends, and not the means, of architecture.

Tzonis and Lefaivre contend that their version of critical regionalism is fundamentally different than past regionalisms, although common points exist between them. Past regionalisms have the same goal of liberation and independence from a foreign rule. The Romantic Regionalists of the 19th century, for example, are concerned with the issue of nationalism, and they use symbolism as a means to achieve this end. Critical regionalism, according to Tzonis, is

also an "emancipatory cultural movement" that makes use of symbolism, but it also relies on different "architectural means" when doing so (Tzonis, 1994, 78). Additionally, critical regionalism differs from romantic regionalism in that it "abandons the chauvinistic emulations promoted by totalitarian regimes in the 1930s" (Tzonis, 1994, 78). Thus it is the means employed to achieve the end that makes critical regionalism "an attitude, not a style" (Tzonis, 1994, 78). Kenneth Frampton echoes this belief, and he even goes as far as to rename the theory of critical regionalism. He believes that "-ism" presupposes a style and provides the new title of "place-form and cultural identity" (Frampton, 1988, 23).

Kenneth Frampton

Although Frampton proposes a new title for the theory, his intentions are essentially the same as those of Tzonis and Lefaivre. Frampton is concerned with "architecture being conceived as fashion or sceneography" because this commodification, he contends, "negates local identity and expression" (Nesbitt, 1996, 468). Modernism causes architectural meaning and identity to disappear, thus creating a placeless architecture with no meaning and identity for its inhabitants. Figure 2.3 is an example of this commodification. National restaurant chains have no concern for their place, thus no cultural meaning for the inhabitants of that place.

Figure 2.3 - *Architectural Commodification.*

Frampton proposes an authentic architecture based on "an understanding of place and tectonics" (Nesbitt, 1996, 468). Like Tzonis and Lefaivre, these aspects concern the architectural means necessary to achieve an authentic/regional end, thus, critical regionalism is an attitude and not a style.

To achieve this authentic architecture, Frampton implies that entire countries must adopt this common goal, not simply a handful of optimistic architects. He cites Switzerland, France, and Japan as a few countries having attained this level of acceptance of, and resistance to, a universal architecture. In these countries, "a certain critical synthesis was achieved between universal civilization on the one hand and national or local culture on the other (Frampton, 1991, 8).

Figure 2.4 - *Jorn Utzon's Bagsvaerd Church, Copenhagen, Denmark.*

For Frampton, Jorn Utzon's Bagsvaerd Church is a prime example of a building that has achieved this synthesis (Figure 2.4). The building system of the church, "comprising an *in situ* concrete frame with prefabricated concrete in-fill elements" has been used numerous times across the globe (Frampton, 1985, 169). The local aspect of the church can be found in the concrete shell vault spanning the nave. Although the reinforced concrete shell vault has almost had secular associations, the "highly configured section adopted for this instance" "reconstitutes a renewed basis for the spiritual...grounds" and is founded on a "regional reaffirmation" (Frampton, 1985, 170).

The United States, he believes, has not reached this level because the media is constantly looking for a "star" architect (Frampton, 1991, 6). Instead of working as individuals within a common entity with a common goal, the media has encouraged individual architects to constantly try to "one-up" their competition. This struggle for exposure negates any chance of working toward a common goal. Such a high level of architectural culture will be achieved only when the "highly individual forms of narcissism" are abandoned (Frampton, 1996, 476).

Frampton also believes that critical regionalism is an effective means of resistance against the homogenization of the built environment. Quoting Paul Ricoeur, Frampton sees the "phenomenon of universalization" as an "advancement of mankind," but, on the other hand, it is also a sort of "subtle destruction" of traditional cultures and the "creative nucleus of great civilizations and great cultures" (Frampton, 1996, 470). By referring to universalization as a "phenomenon," Frampton implies that it has positive merits. The most important of these is the fact that it reflects the current status of society. Geographical, cultural, and economic boundaries are being broken. This is a great opportunity for society, as well as architecture. This is a great opportunity, however, that must be exploited in moderation. Although *universalization* is an attempt to remedy societal fragmentation, it is important to prevent this trend from completely engulfing cultures, especially developing cultures. It is imperative that these cultures retain their true spirit when attempting to become part of the new global society. In other words, as *cultures* become part of *civilization*, they must not surrender their *genius loci*. The distinction Ricoeur makes between *culture* and *civilization* can be read as a distinction between a "local, particular phenomenon" and a "dominant universal" phenomenon, as well as a distinction between *nature* and *technology* (Nesbitt, 1996, 469).

By framing the distinction as one between nature and technology, the implication is made that nature and culture are more natural and particular, whereas technology and civilization are more man-made and portable. Critical Regionalism, according to Frampton, seeks a combination of the two, and modernization affords the ideal setting: "Modernization allows for a critical architecture because it

provides a hybrid situation where rationalized production may be combined with craft" (Frampton, 1988, 27).

The primary aspect of critical regionalism, according to Frampton, is a "commitment to place rather than space," the more specific and identifiable over the more general and generic (Frampton, 1996, 481). Additionally, restating Norberg-Schulz, place is something definite with character, a qualitative, total phenomenon, as opposed to space, which is broad with little to no character. One method to achieve this goal is to build the site, which Frampton believes is one way to express a site's unique characteristics. Building the site can be described as "the engagement with and accentuation of topography" (Nesbitt, 1996, 468). This is in direct contrast to the sites called for by buildings of the International Style, which are flat and clear. Mario Botta's house at Riva san Vitale is a prime example of this postmodern landscaping strategy (Figure 2.5). The tower-like appearance of this residence declares itself as an object in the existing terrain. As Botta states: "Houses are never layered into the contours of a given site, but rather build the site by declaring themselves as primary forms, set against the topography and the sky" (Frampton, 1996, 478).

Figure 2.5 - *Mario Botta's house at Riva san Vitale.*

The importance of place is, unfortunately, lost in the modern city. Frampton believes that the "universal Megalopolis is patently antipathetic to a dense differentiation of culture" and that the intentions of the megalopolis is to reduce the "environment to nothing but commodity" (Frampton, 1996, 482). The resistance inherent in critical regionalism will serve as a check to this tendency because of the importance it gives to creating place. Additionally, a commitment to place over space reflects the inhabitants' preference: "What makes a local

architecture local and unique is valued more than what makes it typical and universal" (Kelbaugh, 52).

Douglas Kelbaugh

Douglas Kelbaugh's theory of critical regionalism builds upon Tzonis and Lefaivre and Frampton's versions, but he does so in a way that provides more context and clarity for the theory. What he terms the "existential dilemma for architects" is an illustration of how critical regionalism can deal with the shortcomings of Modernism, Postmodernism, and Deconstructivism:

> "On the one hand, the social and technological agenda of Modernism still seems correct. But the modernist commitment to place, context, history, craftsmanship, and resource and energy conservation seems distinctly lacking. On the other hand, the urban agenda of Postmodernism still seems right-minded, but its Neoclassical ornament and tectonics seem pasty and superficial when attempted today...And Deconstructivism gives in too easily to the dehumanizing and alienating forces of the millennium at hand" (Kelbaugh, 72).

The solution to these problems is the architecture that critical regionalism will produce, architecture that celebrates regional characteristics. This celebration of a region's uniqueness will counter the homogenization and commodification of architecture.

Kelbaugh also offers a summary of the characteristics of critical regionalism. This is helpful since neither Tzonis and Lefaivre nor Frampton ever give a precise summary of what critical regionalism means to them. Kelbaugh provides five characteristics or "attitudes" that are common to critical

regionalism: *sense of place, sense of nature, sense of history, sense of craft, and sense of limits* (Kelbaugh, 73). These tenets, when honored in design, will lead to an architecture of place.

A *sense of place* has already been discussed. To summarize: "Critical regionalism first and foremost starts out with a love of place. This topophilia seeks to liberate the *genius loci*...It honors climate, topography, vegetation, building materials, and building practices...It prefers local authenticity to sophisticated imitation"...it is an "act of protection" as well as an "act of resistance" (Kelbaugh, 73-74). Also mentioned earlier, a sense of place does not mean total isolation from the outside world. Kelbaugh firmly believes that critical regionalism must not be too sensitive and/or resistive to change or the result could be a "sour cynicism or saccharin sentimentality" (Kelbaugh, 74).

A *sense of nature* deals with environmental concerns, as well as the importance of using nature as a model for design. As a model to follow when designing, nature is our best option because "it holds the key to vitality and sustainability" (Kelbaugh, 75). Society would benefit if the biological ecosystem is adopted as a model. Nature's processes have occurred for millions of years, and will continue to do so if we can achieve a better relationship between the built environment and the natural environment. This is a reiteration of the importance of developing and sustaining a healthy relationship with the *genius* of our surroundings.

A *sense of history* addresses the mistakes made by past revivalists and revivalist styles. Kelbaugh makes it clear that studying history is important in order to gain a better understanding of the design principles used, but that the historical analysis should not be used as "a grab bag of forms" (Kelbaugh, 78). Historical precedents should be used as a

point of departure in the design of a building. This allows for a continuity of design across generational boundaries. When design "rhymes across time it demonstrates a sense of history" (Kelbaugh, 79). This will help to retain a memory of the site's history, as well as develop a place-specific architecture.

A *sense of craft* is a call for the return of quality in construction, as well as a reduction in the importance placed on quantity. Kelbaugh believes that "the construction of buildings has become junkier" because they are being built with less human care and of less natural and less substantial materials (Kelbaugh, 79). Buildings of today are built with a life expectancy of no more than twenty to twenty-five years. Industrialization has caused less-durable materials to be used which ultimately leads to a "disposable building." Examples of this shift in materials include aluminum over copper, asphalt over slate, plastic laminate over marble, particle board over wood, and sheetrock over plaster (Kelbaugh, 79). It is unfortunate that the only way this will change is if society has a fundamental shift in thinking. In this country, the majority of people consider new to be better. New buildings are preferred over older buildings. In Europe, on the other hand, businesses want to be located in the oldest building possible. Europeans see the building as a reflection of their business and older buildings emanate stability, endurance, and strength.

A *sense of limits* is "about the need for finitude and for physical and temporal boundaries to frame and limit human places and activities. It is about the need for human scale in the built environment. It is about psychological boundaries- ones that make life more understandable and negotiable" (Kelbaugh, 82). This is opposed to the International Style which saw space as "abstract, neutral, and continuous" (Kelbaugh, 81). Limits, according to Kelbaugh," are what differentiate place from raw

space" (Kelbaugh, 82). Circumstance and place, two things the Modern Movement ignore, are what differentiate one place from another. Limits will help to emphasize these traits.

As a theory, critical regionalism works. Its desire to create regional identities through the use of local materials, building practices, and cultural characteristics was much needed during the late 1970s and early 1980s, and its importance is every bit as strong today. The new global economy is making it possible to eliminate cultural differences that used to serve as the foundation for regional architecture. This tendency must be put in check.

Just as critical regionalism is successful because of its theoretical basis, its biggest shortcoming is also its theoretical basis. Although Kelbaugh attempts to classify the tenets of this theory, there is still no real definition of a critical regionalist architecture. Does satisfying just one of Kelbaugh's five tenets justify a critical regionalist building? If the precedents provided by Tzonis and Frampton are used as a measuring device, then yes. All the precedents listed has only one aspect of a critical regionalist building.

Overall, the theory of critical regionalism relies too heavily on the subjective aspects of architecture. Due to this fact, it is difficult to define the boundaries.

CHAPTER 3 SUSTAINABILITY

Although definitions of sustainability are numerous and varied, the essence of each deals with the preservation of natural resources to ensure the survival of future generations. The 1987 meeting of the *World Commission on Environment and Development* produced the document, "Our Common Future," which defined sustainability as follows: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (van der Ryn, 5).

One way to achieve this goal concerns fitness between the natural and built environments. How our world fits into the natural world is an idea that seems to have been lost with Modernism, especially the International Style. Fitness between the natural and built environment can occur on different levels, and one such level can be achieved by utilizing the concepts of bioclimatic design.

Bioclimatic design, or bioclimatology, is a term coined by Victor Olgay and deals with a building's adaptations to the local environment. As Vitruvius stated in *De Architectura*: "…the style of buildings ought manifestly to be different in Egypt and Spain, in Pontus and Rome, and in countries and regions of various characters. For in one part the earth is oppressed by the sun in its course; in another part the earth is far removed from it; in another it is affected by it at a moderate distance" (Olgay, 4). "Fitting" a building to its bioclimatic location will not only lead to a place-specific architecture, but it will also ensure a greater life span for the building. As Olgay states: "In natural history the rule is universal that only species are fit to survive which are in harmony with their environment, balanced with their tissue materials, and adapted to all internal and external forces to which they are exposed" (Olgay, 84).

Figure 3.1 - ***Cliff Dwellings of the Anasazi Indians, Mesa Verde, Colorado.***

The cliff dwellings in Mesa Verde, Colorado are a prime example of this fitness (Figure 3.1). Built by the Anasazi Indians, the location of these dwellings under the edges of cliffs is due to the harsh summer sun. During the summer months, the sun is blocked by the cliff edge. During the winter months, however, the low angle of the sun allows the sun's heat to reach the dwellings. With only one exposed side, the cold winter winds were blocked, and the thermal qualities of the earth helped to mediate temperature fluctuations within the dwellings.

Bioclimatology is essentially a plea for a more healthy relationship between the natural and built environment, something Norberg-Schulz believes was lost during the Industrial Revolution. New technologies, most notably those that allowed for climate-controlled buildings, caused the relationship between man and nature to diminish, if not totally disappear. Prior to this time, buildings were built with a relationship to, and respect for, nature in mind. This was imperative for the existence of "comfortable" living conditions. It was also imperative, as with the ancient Romans, in order to have a good relationship with the *genius* of the place.

The fitness bioclimatology calls for is important in the design of an energy-efficient building. Bioclimatic design, however, is concerned only with the use of climate to inform the form and order of a building. It does not address the broader scale of ecosystems and how to achieve fitness within them. Sustainability, however, does address ecological fitness.

The definition of sustainable design mentioned earlier gives sustainability a specific goal, a common cause. It does not, however, elaborate on the means necessary to achieve this end. It thus has an "interpretative flexibility" that is necessary for

anything portable (Guy & Farmer, 146). This is why sustainable design, according to Susan Maxman, "isn't a prescription. It's an approach, an attitude. It shouldn't really even have a label. It should just be *architecture*" (Guy & Farmer, 140).

"Sustainable Design isn't a prescription. It's an approach, an attitude. It shouldn't really even have a label. It should just be architecture"

-Susan Maxman

If sustainable design is viewed as an "attitude" or an "approach," then it is imperative that it begin with the individual. State, National, and/or Global policies and regulations can prescribe rules and regulations indefinitely, but all is useless unless the individual is the catalyst. "Sustainability is...the domain of grass roots environmental and social groups, indigenous people preserving traditional practices and people committed to changing their own communities" (van der Ryn, 4). Additionally, one of David Orr's four characteristics of (ecological) sustainability reads as follows: "A sustainable world can be redesigned and rebuilt only from the bottom up. Locally self-reliant and self-organized communities are the building blocks for change" (van der Ryn, 7).

It is not possible to force someone to believe in something, to force "our" beliefs on "him or her." What is possible, however, is to make a believer out of those who have not yet accepted the importance and benefits of sustainable design. This entails elevating an individual's level of education and awareness, thus allowing them to gain a greater knowledge of how we fit into the world around us. If the importance of sustainable design is brought down from the global scale of acid rain and the melting of our polar ice caps and placed on the level of you and me, it is only logical that we will be able to better relate to it. This is, I believe, one of the important roles the architect plays- creating a relationship between the building and its occupants in order to create an experiential architecture.

Traditionally, the experiential aspect of architecture has not been a major concern of sustainable design. However, if sustainable design is to aid in the creation of a place-specific architecture, it must form a relationship between both the environment and the occupants. Holistic design is only possible when a fitness exists between the individual, the natural environment, and the built environment. Critical regionalism seems more concerned with a fitness between the individual and the built environment and sustainability seems more concerned with a fitness between the built and natural environments. An Integral Theory of Place, however, is concerned with creating a fitness between all three.

CHAPTER 4 THE IMPORTANCE OF PLACE

"A society develops in a place. Without the grounding of place, a society is not rooted. A society that can exist in all places is a society that exists in no place. Without this grounding, a sense of alienation can exist. Arguably, there are elements of western society that are becoming similar across countries due to the influence of mass culture, however, there is a greater part of society that is unique in its identity. This uniqueness is part of the society's memory. Without the grounding of place, this memory would not exist."
-Lester Korzilius

This quote by Lester Korzilius expresses the importance of a society possessing an identity. An identity implies a uniqueness, or a distinguishing characteristic. Mass culture, or the current trend of globalization, is making it difficult for a society to gain and/or retain an identity. If a society has nothing unique about it, nothing that distinguishes it from other societies, it will be difficult, if not impossible, for the people of that society to gain an identify. "Human identification with a place presupposes that places have character, that is, attributes which distinguish one place from another and which lend to a place its unique presence or *genius loci*" (Abel, 143).

The term *genius loci* is an ancient Roman idea that concerns an individuals true being. According to this belief, every individual, or "independent being," has a guardian spirit, or a *genius*, that determines their true spirit. "This spirit gives life to people and places, accompanies them from birth to death, and determines their character or essence…the *genius* thus denotes what a thing is" (Norberg-Schulz, 422.) The environment was considered an "independent being" consisting of numerous characters, thus, it had its own *genius*. It was thus considered imperative for ancient man to have a good relationship with the *genius* of the place in which he or she lived. The ancients considered the environment's *genius* that "opposite" that man must both acknowledge and harmonize with in order to fully and successfully dwell.

Although this is a fairly simplistic explanation of a deeply complex idea, let it suffice to say that the ancient Romans recognized the importance of being in harmony with their environment. Their "physical" and "psychic" survival depended on it (Norberg-Schulz, 422).

"A society that can exist in all places is a society that exists in no place."

-Lester Korzilius

A second critical component Norberg-Schulz deals with is the importance of individuals being able to identify with their environment. Drawing from Heidegger's concept of dwelling, Norberg-Schulz believes that, when man dwells, the psychological functions of *orientation* and *identification* are involved (Norberg-Schulz, 423). Orientation is important because someone has to know where he or she is in order to gain an "existential foothold"; identification is important because of the importance of knowing *how* one is in a certain place (Norberg-Schulz, 423). Without these two psychological functions fully developed, man will feel lost in his environment, and fear will set in. Although these two parts are independent of each other, it is only possible for one to truly belong if both of these psychological functions are fully developed (Norberg-Schulz, 424). Additionally, in order for identification with the surroundings to occur, it is necessary for there to be certain "concrete environmental properties" present (Norberg-Schulz, 424).

Man's relationship with these objects of identification, according to Norberg-Schulz, is developed during childhood and thus determine all future experiences. Examples of such objects include the color of the spaces and the texture of surfaces (sand, earth, stone, moss, etc...) we play in and on as a child, characteristics of the climate (hot, cold, sunny, overcast, windy,etc...), and the noises associated with each (Norberg-Schulz, 424). Without any means of identification or orientation, man cannot feel safe in his place. For Heidegger, dwelling

means to be at peace in a protected place. For Norberg-Schulz, dwelling means "to gather the world as a concrete building or "thing," and that the archetypal act of building is the enclosure (Norberg-Schulz, 25). What this says is that in order for man to dwell, the world around him must be gathered, or made habitual. Additionally, there must be a differentiation made within space (something broad with little to no character) into place (something definite with character, a qualitative, total phenomenon). The enclosure, which is the true origin of architecture, accomplishes this gathering and helps man to gain orientation and identification with the place.

The importance of the enclosure cannot be underestimated for it is one of the basic properties of man-made places. Although a full explanation of its importance is outside the scope of this investigation, let it suffice to say that for Heidegger, Norberg-Schulz, and others the enclosure is what gathers the "inhabited landscape" and brings it close to man (Norberg-Schulz, 417). Enclosure distinguishes the inside from the outside and creates place from space.

CHAPTER 5 AN INTEGRAL THEORY OF PLACE

"The purpose of architecture is basically the construction of place"

-Tadao Ando

As Ando's statement implies, architecture is the practice of using clues from the site to construct a place- an area designed with the physical and cultural environments and its inhabitants in mind.

"An integral theory of place, as a pattern, provides the particulars of the portable, but not the specifics of the particular."

An Integral Theory of Place is an attempt to construct a more holistic, place-specific architecture. A more holistic architecture entails a "both-and" approach to design, as opposed to an "either-or" approach. It addresses both the objective issues of design, such as achieving an environmentally fit building, and the subjective issues of design, such as personal experience and cultural meaning in the built environment. Good architecture should address both spheres of our living environment.

An Integral Theory of Place pulls aspects from both critical regionalism and sustainable design. In doing so, it addresses the successes and failures of each. The theory of critical regionalism fails due to its lack of concern for the objective issues of design, such as ecological fitness. Sustainability fails due to its lack of concern for the subjective issues of design, such as human experience. An Integral Theory of Place addresses these shortcomings by proposing a process of design that incorporates both the subjective and objective spheres. Conceived as a pattern of design, it provides the particulars of the portable, but not the specifics of the particular. Like the principles of sustainable design, it does not propose the means to achieving the end. It also has an "interpretive flexibility" that places, on the architect, the responsibility of integrating the specifics to achieve a place-responsive design.

CHAPTER 6 THE PORTABLE PARTICULAR

With a "particular" architecture becoming a paramount concern in today's society, it is important that this architecture be holistic in its approach and goals. The global economy, as well as a global architecture, is sweeping across cultures of all shape, size, and stage of development. It seems an appropriate time to propose a new way of thinking and designing in this highly influential field of architecture. This new way of thinking and designing should be systematic in its approach, applicable in all situations, and aim to produce a fitness between the built environment, the natural environment, and the inhabitants.

Architects have the power, and ethical responsibility, to instigate this change in thinking and design thanks in large part to the rapid dissemination of information throughout the world. This rapid movement of information allows for a single approach to architectural design- a holistic architecture of place- to reach all corners of the globe. The key is for this new way of thinking and designing to be broad in scope, yet specific enough in its result as to forge a local identity and create a sense of place.

This thesis offers the process of the Portable Particular (Figure 6.1) as a possible solution to the paradox. Conceived of as a pattern of design, it is thus portable by nature. It can be applied

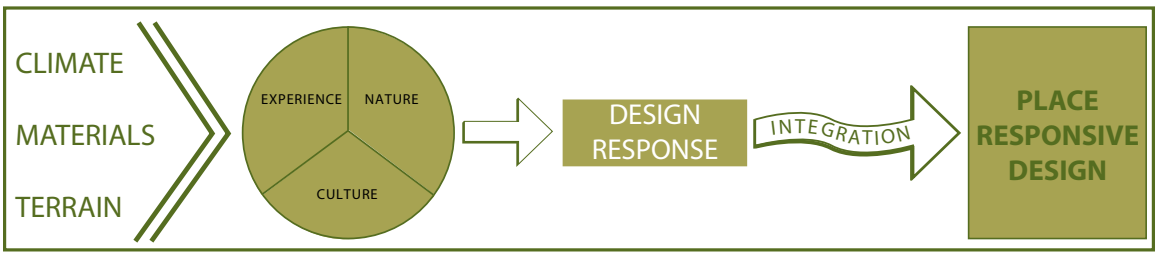


Figure 6.1 - ***The Portable Process.***

to any site, regardless of location. It is an *approach* to design that should not be considered formulaic, but rather should be considered as a method of extracting a site's objective and subjective qualities. These extractions and discoveries should then be used to produce a holistic architecture. What is particular about the Portable Particular is the *emergent* architecture that results from the integration of the particulars.

The Process

The process consists of four steps: Identify, Analyze, Respond, Integrate. These steps are intended to extract those characteristics of a site and help in the creation of a place-responsive design. The steps are also intended to be a way of keeping the qualities and characteristics of a site in an ordered and manageable fashion. (The first two steps will be discussed here, with the last two steps being discussed after a description of the site.)

Identify

The process of identification is difficult in that an attempt to identify all of a site's characteristics may seem overwhelming. In response to this problem, I chose to use the fields of *Climate*, *Materials*, and *Terrain* to limit the scope to a more manageable scale.

Climate- This category deals with the physical climate of a site. Included are such topics as temperature, wind direction, sun angles, annual precipitation amounts, and humidity levels. Some site's will have a climate that fluctuates (moderate climates) while other site's may have a climate that remains relatively constant (warm and/or cold climates). This does not mean, however, that the importance of climatic characteristics

should be neglected. The siting of a building in relation to the sun, wind, and/or the availability of natural daylight should always play a central role during the project's conception.

Materials- In order to claim an environmentally conscious building, the use of materials must be considered a top priority. The use of local materials is important due to the reduction in resources used in the transportation from place of origin to place of manufacturing to place of erection. The use of local materials is essential, although defining a "local material" can be difficult. The two most common definitions deal with materials that are available locally, i.e. locally harvested, and materials that are manufactured locally. It could be argued that this is essentially a distinction between natural and man-made materials, but timber could be harvested in one location, but milled in another location that is across the United States. Thus the distinction fails. For this thesis, both definitions will be included.

Terrain- Topography can also play a key role in designing an environmentally conscious building. Terrain can be utilized as a thermal device in the form of earth berms or sub-terranean buildings, as well as help to restore natural hydrology and mitigate rainwater runoff. What is important is to avoid large scale modifications to a landscape. For example, do not build-up relatively flat sites if the local terrain has little to no changes in elevation and do not flatten sites that have sufficient changes in elevation.

Figure 6.2 - *The Holistic Pie.*

Analyze- The Holistic Pie

Each of the three categories of identification will be analyzed using the Holistic Pie (Figure 6.2). The "pieces" of this "pie" are *nature*, *experience*, and *culture*. This analytical step is how

An Integral Theory of Place becomes a "both/and" approach to design. The "pieces" capture both the objective and the subjective aspects of design.

Nature - This category includes all visible patterns of a place. These are objective and/or quantifiable elements. For example, in terms of the identification category, Climate, such things as wind speed and direction, annual average temperatures, and seasonal sun angles would all be included under this category. These quantifiable aspects should then influence the form and orientation of the building.

Experience - This category deals with the individual experience. It is my contention that experiential places are memorable places and memory is sparked by contrasts. Thus contrasts in any of the three categories of identification could contribute to a building's experience. In terms of thermal comfort, for example, an analysis could include ways to enhance the individual's experience of the place using thermal conditions. Examples could include a contrast of thermal qualities between one place and another, migratory spaces within and around the building, and/or the creation and location of outdoor rooms. Furthermore, by creating spaces that have their use synchronized with the time of the year, an environmental awareness will be achieved on the part of the individual.

Culture - This category deals with cultural meaning and importance. The important question to ask is "What is the cultural significance of climate? terrain? materials?" The cultural significance also has a temporal aspect to it in that past, current, and/or future cultural conditions could be restored/enhanced. What is considered to be culturally significant is left to the judgement of the architect, but the decision should be based on thorough research of the site and its occupants.

CHAPTER 7 THE SITE

Figure 7.1 - *Large Aerial View of Site.*

The site chosen for this project is located at 35 degrees, 57 minutes north latitude and 83 degrees, 55 minutes west longitude. Located across Cumberland Avenue from the southern edge of World's Fair Park (light brown tint) and to the east of the University of Tennessee's The Hill (light green tint) across Second Creek, the site currently has two surface parking lots (Figures 7.1, 7.2 & 7.3). The two parking lots are separated by railroad tracks (Figure 7.4), as well as a 20 foot drop in elevation (Figure 7.5). The lower lot has an additional drop in elevation of 20 feet to the west which forms the eastern bank of Second Creek. The southern part of the site has no clear edge. It flows into two additional surface parking lots with the main access to each located on Neyland Drive (Figure 7.6). The lower lot has vehicular access directly from Cumberland Avenue (Figure 7.7). The eastern border of the site is formed by Poplar Street, which has an elevation increase ranging from 3 feet, on the northern edge, to 35 feet, on the southern edge (Figure 7.8). There is also a pedestrian bridge coming from World's Fair Park that leads to the upper lot (Figure 7.9). There are also stairs leading up a steep embankment to The Hill. The rise in elevation leading up to The Hill ranges from 20 feet on the northern edge to 40 feet on the southern edge. The upper lot has a vehicular entrance on the northeast corner, the lowest level of the lot (Figure 7.10).

ZONING

The upper and lower lots are located within the Central Business District Zone, according to the latest version of the Zoning Ordinance for Knoxville, Tennessee. There are plans

Figure 7.2 - ***Small Aerial View of Site.***

Figure 7.3 - ***Zones of the Site.***

Figure 7.4 - ***Railroad Tracks Intersecting Site.***

Figure 7.5 -*Elevational Differences Between Upper and Lower Lots.*

Figure 7.6 - ***Southern Boundary.***

Figure 7.7 - ***Cumberland Avenue Entrance.***

Figure 7.8 - *View of the Upper Lot*.
View is from the northwest corner, the site's highest point.

Figure 7.9 - *View from the Pedestrian Bridge.*

Figure 7.10 - *View from the Upper Lot's Vehicular Entrance.*

Figure 7.11 - *Proposed Greenway Trail.*

in place, however, to modify the zoning designation to "open space" upon completion of the Eleventh Street Parking Garage. This is an attempt to preserve the land to accommodate a Greenway trail that will form a loop around the downtown and will connect World's Fair Park with the Riverfront. Figure 7.11 shows the proposed trail. As is noted, the trail will proceed along the existing railroad tracks located between the upper and lower lots of the site.

There is also a proposal to extend the World's Fair Park through the lower lot of the site to the river (Figure 7.12). Although very much in the proposal stage, I chose to accept this proposal as true. World's Fair Park has a cultural importance to the residents of Knoxville and its enhancement is given priority for two reasons: First is that the proposal to create an urban green space of such size and in such a prime location is welcomed due to its reduction in urban heat islands and its positive impact on the natural environment. Secondly this proposal is restoring a section of land that was an integral part of the 1982 World's Fair layout (Figure 7.13). Thus the cultural significance of the past and future are covered by this proposal.

Figure 7.12 - *World's Fair Park Extension.*

The chosen site's location is also critical to creating connections between the University of Tennessee, campus, World's Fair Park, and the downtown area. The proposed extension of World's Fair Park will create a north-south connection between the park and the river edge, but there is not a strong east-west connection between the Maplehurst neighborhood to the east and the campus. Along with accepting the park extension, I am also assuming that the surface parking lot to the east of the upper lot, which is

Figure 7.13 -*1982 World's Fair Exposition*.

currently used for the United Methodist Church, will be developed in the future. Therefore, the need for an east-west connection becomes important. This idea will be discussed in more detail shortly.

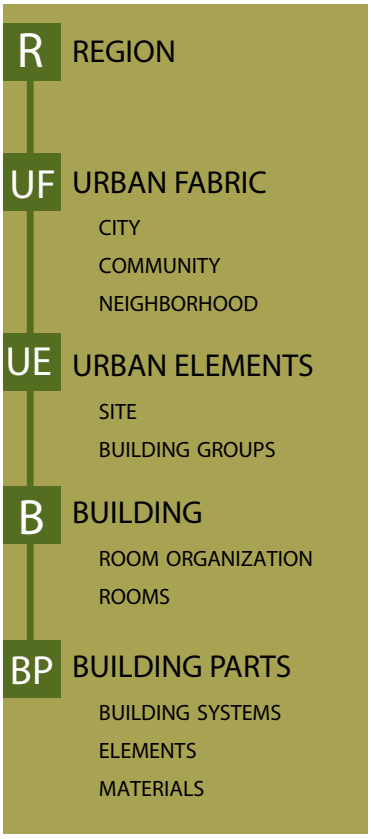


Figure 8.1 - *Scale.*

As previously mentioned, identifying and analyzing the site conditions can be a tedious process. In an attempt to keep the information gathered as orderly as possible a scope and scale needed to be established. Figure 8.1 shows the different scales and their corresponding abbreviated designations. I also created a matrix to provide a coherent framework for the process (Figure 8.2). The matrix shown in Figure 8.2 is a summary of the full matrix. A full explanation of each quadrant will be given below.

It is important to note that the information contained in each quadrant of the matrix is by no means a complete list. With additional time and research, the points of analysis and respective design responses could expand to include a greater level of detail.

Climate

Nature- Analysis

Region- Knoxville is located in the Appalachian Climate Zone, with the Cumberland Mountains to the northeast and the Great Smokey Mountains to the southwest. It is a relatively temperate climate with warm humid summers, and a long and pleasant spring and fall. Winters are generally cool with "chilling" winds. The climate is humid all year with morning humidities ranging from high to very high.

During the winter months, the lows average between 29˚-32˚F, and the highs can reach 52˚F. January is the coldest month. During the summer months, it is hot and humid with 85-90% relative humidity levels. Nighttime temperatures average 64˚-68˚F, with the afternoon highs reaching the upper 80's.

	CLIMATE		TERRAIN		MATERIALS	
	ANALYSIS	DESIGN RESPONSES	ANALYSIS	DESIGN RESPONSES	ANALYSIS	DESIGN RESPONSES
NATURE	Knoxville is located in the Appalachian Climate Zone, with the Cumberland Mountains to the northeast and the Great Smokey Mountains to the southwest. It is a relatively temperate climate with warm humid summers, and a long and pleasant spring and fall. The climate is humid all year with morning humidities ranging from high to very high. The sky condition is mostly overcast and thus should be used as the daylight design condition. Due to Knoxville's valley location, the prevailing wind direction is greatly effected. Daytime winds prevail from the southwester, and nighttime winds prevail from the northeast. However, day-night reversals in direction are common. There is a high level of annual rainfall.	Due to the SW-NE wind direction, the existing trees and plantings can be used to cool summer breezes- *Interwoven Buildings and Plants*. Allowing the wind to cool the building groups is also necessary. A *Dispersed Building* layout will accomplish this. Adjacent buildings can be used to provide shade during the summer months- *Shared Shade*. In order to passively heat the buildings during the winter months, as well as allow sun to winter outdoor rooms, adhere to the *Solar Envelope*, established according to the sun angle of the November/January sun (35˚).	From the scale of the region to the scale of the site, steep, moderate, and low slopes define the east Tennessee terrain. The terrain of the area surrounding the site is not unlike that of the region. Both sides of World's Fair Park are defined by moderate slopes. The site is also characterized by extreme changes in elevation. From the highest point on the site to the lowest, the elevation difference is around 70 feet. The natural east to west slope was destroyed with the construction of the World's Fair Park.	The relatively unique terrain of east Tennessee is something that should be enhanced. This could mean additional pedestrian bridges as connectors and/or places within the site that enhance distant views. When enhancing the terrain, a decision must be made whether to enhance the existing terrain, or attempt to restore it to its original state with the new construction. It may be possible, however, to do both- *Topographic Restoration.*	Within the region, several different materials are available. These include limestone, granite and Crab Orchard stone, hardwood (from the Appalachian Oak Forest), marble, and clay (used in the making of bricks). Industrial materials, mainly aluminum, can be obtained from ALCOA. Corrugated Metal is another material used frequently in this area. Its mainly used as a roofing material. The existing materials on the site include pavement, brick, and treated hardwood logs used in smaller retaining walls (*Nature Retaining Nature*). There are also railroad ties used for stairs and seating.	The existing pattern of *Nature Retaining Nature* should be repeated when possible. This type of retaining wall adds a good deal of character to the site and is also more on the human scale. *Brick Pavers* for pedestrian paths could possibly be developed as a pattern. Another possible pattern is *Timber Technology*. This pattern would deal with when and where to use wood in and around the building complex.
EXPERIENCE	Perhaps the most significant natural resource for this region is water, due to the strong impact of TVA.	Water should be celebrated. This could mean fountains, reflecting pools, and/or expressive rainwater catchers and storage. The location of *Outdoor Rooms* can create a repetitious social pattern if done properly.	The inhabitants of this region have grown accustomed to the topographic differences. It is, thus, something they identify with. These differences should not be leveled, but should be enhanced through building.	Enhancing the terrain is again a priority- *Topographic Restoration.*	There is currently no obvious cultural use of materials. This may, or may not, be due to the variety of materials readily available.	There is currently no obvious cultural use of materials. This may, or may not, be due to the variety of materials readily available. There is a good deal of vernacular stone architecture. Brick is possibly the most commonly used material , but is this enough to constitute a "regional" use of materials? I say no.
CULTURE	In order for people to experience a building, a contrast of some sort should be present. In this case, the contrast could be one of temperature. By allowing different temperatures to exist in different parts of the building(s) at different times of the year, people will naturally migrate to the space that is the most comfortable.	*Migrational Spaces* can be one means of achieving the temperature contrast. The spaces could be either inside or outside, or a combination of the two. Not only will this provide memorable experiences, but it will also tune people in to the changing seasons, thus creating a healthier connection between nature and the individual.	Just as changes in temperature can amplify individual experiences, sudden perceived changes in elevation can do the same. *Exterior Balconies* and *Rooftop Terraces* can capture views to the surrounding landscape thus also increasing one's awareness of an elevated position.	*Elevated Connections* between spaces, *Exterior Balconies* and *Rooftop Terraces.*	The quality a material possesses has a tremendous effect on the character of the space it is in. Wood has a "warmer" feeling than brick, and brick feels "warmer" than concrete (although concrete has better thermal storage properties).	*Timber Technology* will provide insight into when and where to use wood at the scale of the building complex, as well as the scale of the building. An example could be a "Building Rooms" scale use of *Warmer Wood* to determine appropriate wood types for interior finishes and floorings.

Figure 8.2 - *The Matrix.* *The analysis of each category of identification, with regards to the pieces of the Holistic Pie are listed, as well as their respective design responses.*

The sky condition is mostly overcast and thus should be used as the daylight design condition. Skies are usually overcast from November - June and September, with scattered clouds in July and August. October is the only predominantly clear month. There is, however, sufficient sunlight to passively heat buildings when the temperature drops into the cool range.

Due to Knoxville's valley location (Figure 8.3), the prevailing wind direction is greatly effected. Daytime winds usually have a southwesterly prevailing direction, and the nighttime winds usually blow from the northeast. However, day-night reversals in direction are common. Wind speeds are almost always greater than 5 mph, which increases the chances of cooling by ventilation, but necessitates wind protection during the winter. The wind speed, however, will not reach this level in an urban city center.

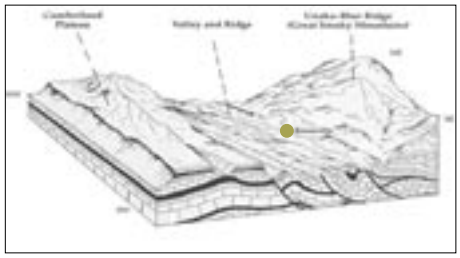


Figure 8.3 - *3-D Topographic Map.*

Knoxville is also characterized by a high level of annual rainfall. The greatest amounts of precipitation occur during the winter and late spring to early fall periods. The late fall is the driest time of the year. A summary of Knoxville's climatic conditions can be seen in Figure 8.4.

Nature- Response

Region- Due to the SW-NE wind direction, the existing trees and plantings can be used to cool summer breezes- *Interwoven Buildings and Plants.*

Urban Elements- Allowing the wind to cool the building groups is also necessary. A *Dispersed Building* layout will accomplish this. Also, adjacent buildings could be used to provide shade during the summer months- *Shared Shade.*

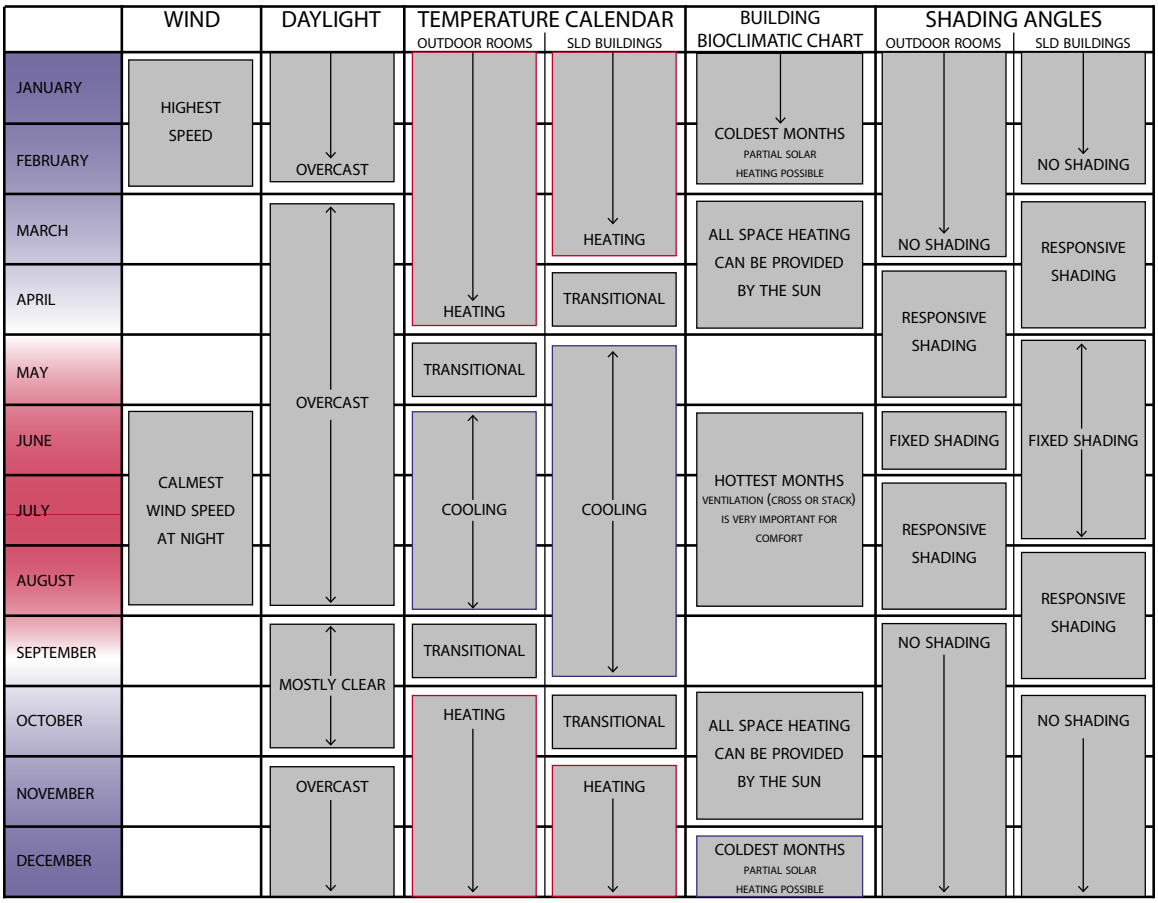


Figure 8.4 - *Climatic Summary.*

In order to passively heat the buildings during the winter months, as well as allow sun to winter outdoor rooms, adherence to the *Solar Envelope* is essential.

Other possible design responses include: *E-W Elongated Buildings, Wind Breaks, Breezy Streets, Migrational Spaces, Rain Catchment and Storage.*

Building- Possible design responses at the building scale include: *Stack Ventilation, Solar Heat Collection, Outdoor Rooms (summer & winter), Overhead Shade, Responsive Roofs, Permeable Buildings, Thin Plan, Breezy/Calm Courtyards.*

Experience- Analysis

In order for people to experience a building, a contrast of some sort should be present. In this case, the contrast could be one of temperature. By allowing different temperatures to exist in different parts of the building(s) at different times of the year, people will naturally migrate to the space that is the most comfortable.

Experience- Response

Migrational Spaces can be one means of achieving the temperature contrast. The spaces could be either inside or outside, or a combination of the two. Not only will this provide memorable experiences, but it will also tune people in to the changing seasons, thus creating a healthier connection between nature and the individual.

Culture- Analysis

Region- Perhaps the most significant natural resource for east Tennessee is water, due to the strong impact of TVA. Water not only means power for the people of east Tennessee, but it also creates jobs and a stronger economy. Rainfall is also an integral part of the status of the oak forests of this region. The high amounts of rainfall greatly reduce the possibility of forest fires. This allows the trees to grow unusually straight and tall.

I currently have no knowledge of any cultural patterns associated with Knoxville's climatic character. In general, however, social activities take place outdoors during the Spring, Summer, and Fall, with indoor activities occurring during the Winter. Any social activity can become a cultural phenomenon if repeated many times.

Culture- Response

Urban Elements- It does not seem appropriate to conceal the storage and movement of water because of its impact on the development of this region. Water should be celebrated. This could mean fountains, reflecting pools, and/or expressive rainwater catchers and storage.

The location of *Outdoor Rooms* can create a repetitious social pattern if done properly. Knoxville's climate calls for winter outdoor rooms to be on the southwest side of the building. This allows access to the winter sun, but will need wind breaks for protection from the winter wind. Summer outdoor rooms should be on the northwest side of buildings. This allows access to the summer breezes and shade from most of the summer sun.

Terrain

Nature- Analysis

Region- Knoxville is located in the Appalachian Valley, with the Cumberland to the northeast and the Great Smokey Mountains to the southwest. From the scale of the region to the scale of the site, steep, moderate, and low slopes define the east Tennessee terrain.

Urban Fabric- The terrain of the area surrounding the site is not unlike that of the region. The World's Fair Park is located in a depression originally caused by the path of Second Creek, but greatly enhanced when construction began on the park in the late 1970s. Both sides of the Park are defined by moderate slopes.

On the scale of the Neighborhood, there is a building pattern that places buildings parallel to the slope. This has the benefits of thermal protection, preserving open space, and multiple and topographically varied connections from the building to the outside. It is important to take into account, however, the high humidity levels when designing this way. Since at least 60% of the building's walls will be covered with earth, ventilation of the space is necessary.

Urban Elements- The site is also characterized by extreme changes in elevation. From the highest point on the site to the lowest, the elevational difference is around 70 feet. The natural east to west slope flowing down to Second Creek was destroyed with the construction of the World's Fair Park.

Nature- Response

Urban Elements- The relatively unique terrain of east Tennessee is something that should be enhanced. This could mean additional pedestrian bridges as connectors and/or places within the site that enhance distant vistas. The location of vertical circulation cores on the site thus assumes an important role because these can be possible means to achieve the goal.

When enhancing the terrain, a decision must be made whether to enhance the existing terrain, or attempt to restore it to its original state with the new construction. It may be possible, however, to do both- *Topographic Restoration*.

Experience- Analysis

Urban Elements- Just as changes in temperature can amplify individual experiences, sudden perceived changes in elevation can do the same. A spatial sequence progressing from enclosure to relative openness, and back to enclosure is one possible method.

Experience- Response

Urban Elements & Building- Elevated Connections between spaces help enhance the individual experience, as well as *Exterior Balconies* and *Rooftop Terraces* that allow one's elevated location to be discovered.

Culture- Analysis

Region- The inhabitants of this region have grown accustomed to the topographic differences. It is, thus, something they

identify with. These differences should not be leveled, but should be enhanced through building.

Culture- Response

Urban Fabric- Enhancing the terrain is again a priority, especially for a site in Knoxville. An attempt should be made to restore the topography of the land to its original state before its manipulation for the World's Fair in 1982- *Topographic Restoration*.

Materials

Nature- Analysis

Region- Within the region, several different materials are available. These include limestone, granite and Crab Orchard stone, hardwood (from the Appalachian Oak Forest), marble, and clay (used in the making of bricks). Industrial materials, mainly aluminum, can be obtained from ALCOA. Corrugated Metal is another material used frequently in this area. Its mainly used as a roofing material.

Urban Elements- The existing materials on the site include pavement, brick, and treated hardwood logs used in smaller retaining walls (*Nature Retaining Nature*). There are also railroad ties used for stairs and seating.

Figure 8.5 - *Nature Retaining Nature.*

Nature- Response

Urban Elements- The existing pattern of *Nature Retaining Nature* (Figure 8.5) should be repeated when possible. This type of retaining wall adds a good deal of character to the site and is also more on the human scale.

Brick Pavers for pedestrian paths could possibly be developed as a pattern. Another possible pattern is *Timber Technology*. This pattern would deal with when and where to use wood in and around the building complex.

Experience- Analysis

The quality a material possesses has a tremendous effect on the character of the space it is in. Wood, for example, has a "warmer" feeling than brick, and brick feels "warmer" than concrete (although concrete has better thermal storage properties). The decision concerning what materials to use in the construction and finishes of a building will play a major role in how people perceive the building and its spaces.

The choice to be made concerning materials should not be made without considering how the materials will relate to each other, as well as their context. Familiar materials could possibly be used in unfamiliar ways to create a memorable experience for the visitor and/or occupant. This act of *defamiliarization* helps to create a "dialogue" between building and building occupant.

Experience- Response

Timber Technology could provide insight into when and where to use wood at the scale of the building complex, as well as the scale of the building. An example could be a "Building Rooms" scale use of *Warmer Wood* to determine appropriate wood types for interior finishes and floorings.

Culture- Analysis

There is currently no obvious cultural use of materials. This may, or may not, be due to the variety of materials readily available. There is a good deal of vernacular stone architecture, most likely Crab Orchard Stone, but not much other building types. Brick is possibly the most commonly used material for an exterior veneer for both residential and commercial, but is this enough to constitute a "regional" use of materials? I say no.

Culture- Response

In essence, this opens the door to an almost infinite number of directions concerning material use. The only apparent limitation is ensuring that regional materials are used. But the variety of materials considered "regional" provides little, if any, hinderance in the design process. A possible goal could be to develop a pattern of material use that society can begin to identify with. If and when this occurs, the first step has been taken toward developing a cultural use of building materials for east Tennessee. As previously stated, the repetition of a societal occurance can lead to a cultural phenomenon.

The Pattern Map

In yet another attempt to organize the various pieces of information obtained thus far, I organized the possible design response patterns in a way that illustrates the scale and relationships of each one. Figure 8.6 shows this map. It is worth mentioning again that what is meant by a pattern is a configuration of relationships where each pattern is simultaneously part of a larger pattern, as well as the culmination of several sub-patterns. Patterns exemplify the interrelationships of the elements of design and make explicit

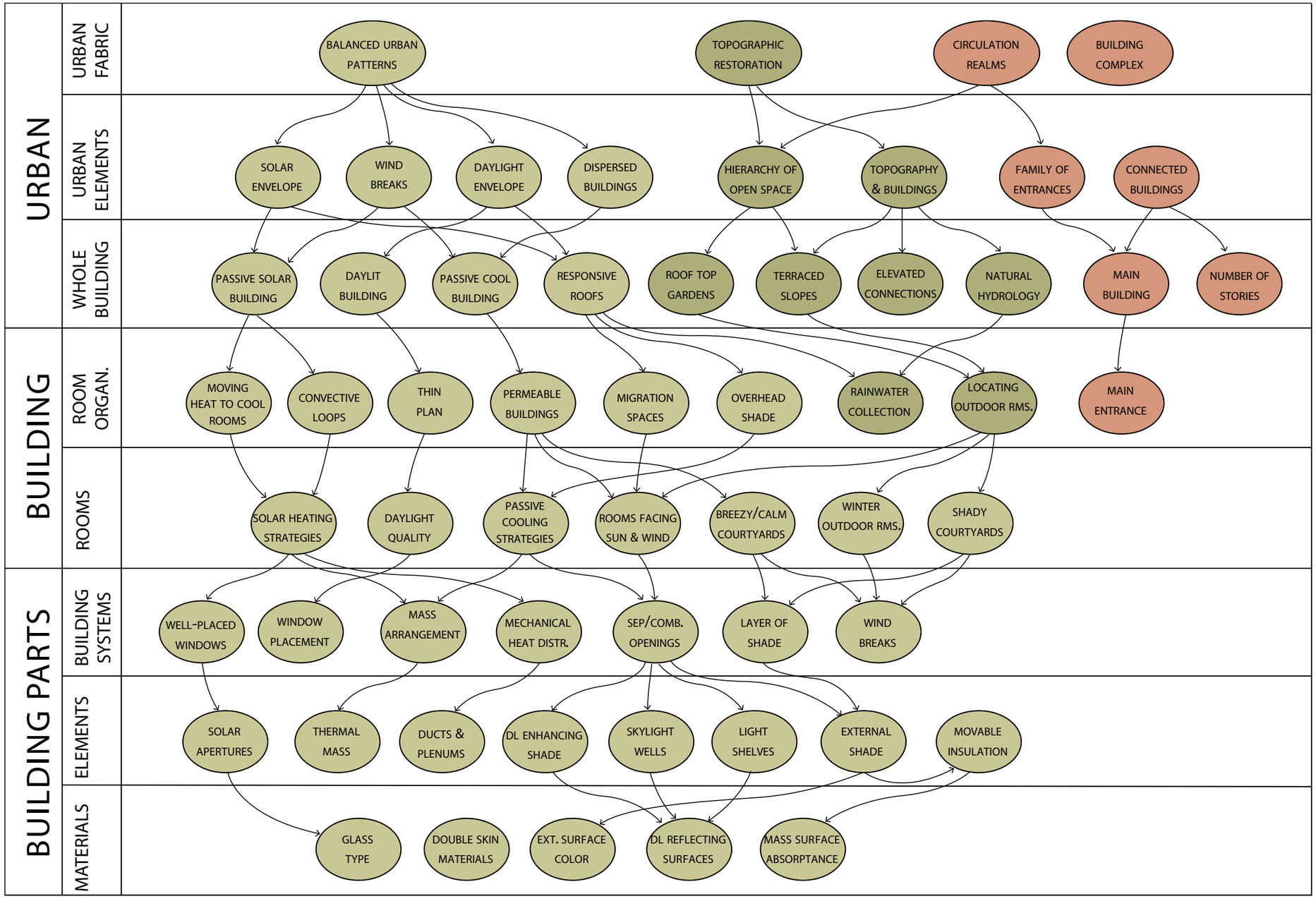


Figure 8.6 - ***The Pattern Map.***

the fact that nothing in architecture stands alone. This is the new way of thinking that is essential in the creation of a holistic architecture.

To help and clarify these patterns, brief explanations of a select few are given below. (Please note that the diagrams shown are to illustrate the "portable" conditions of the patterns.) *Topographic Restoration* (Figure 8.7) deals with the restoration of land that has been artificially manipulated. Its purposes are: to restore the original topography, to restore the natural hydrology to promote infiltration and reduce run-off, and to eliminate slopes too steep to be occupied.

Figure 8.7 - *Topographic Restoration (Portable).*

The pattern of *Dispersed Buildings* (Figure 8.8) is an urban scale pattern that is concerned with building placement in relation to the prevailing wind direction. Proper placement in relation to the surrounding obstacles will ensure the possibility of naturally ventilating the site.

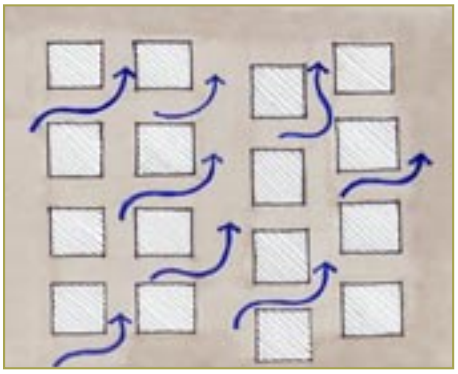


Figure 8.8 - *Dispersed Buildings (Portable).*

Topography and Buildings (Figure 8.9) deals with the relationship between buildings and the surrounding topography. Depending on the building's program and project goals, the placement of the building can help to facilitate the creation of outdoor rooms, establish thermal barriers, and/or enhance the local topographic condition by creating extreme differences between the ground and an elevated position. This last situation could be used to amplify rather moderate changes in elevation to make the occupant more aware of the surroundings.

Figure 8.10 illustrates the pattern of *Responsive Roofs*. The intention of this pattern is to promote roof design that is multi-functional. The primary goals are to design roofs that: provide

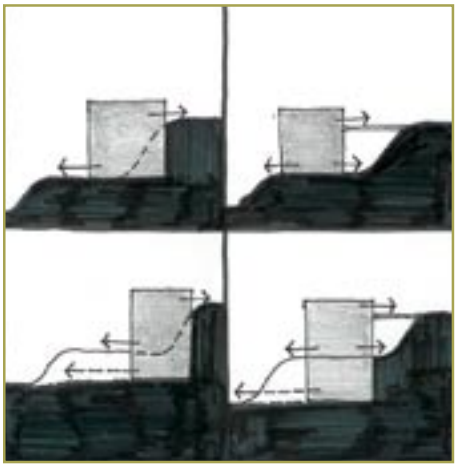


Figure 8.9- *Topography and Buildings (Portable).*

protection from the natural elements, when desired, facilitate the cooling process of stack ventilation, and help to channel rainwater to storage areas so the water can be reused for non-potable building uses.

Rainwater Collection (Figure 8.11) deals with the collection and reuse of rainwater. Rainwater can be captured and reused to reduce the potable water demands of a building for acts that do not require clean water. Such acts could include, but are not limited to, irrigation and building sewage conveyance. The process of collection, storing, and reusing rainwater will also help reduce the amount of water runoff and increase the amount of infilatration.

Figure 8.10- *Responsive Roofs (Portable).*

The pattern of *Locating Outdoor Rooms* (Figure 8.12) deals with *designing* outdoor spaces during the early stages of a project. Properly designed outdoor spaces can help to reduce the heat island effect in an urban context by providing shade when and where necessary, promote social interaction by creating thermally comfortable spaces, and help create a stronger connection between the occupant and the natural environment by designing different room locations based on the seasons. It is imperative when designing outdoor rooms to know the seasonal sun angles and wind directions so it will be possible to have sun-saturated spaces with no wind during the winter and shaded spaces with access to wind during the summer. Adequately designed outdoor rooms should be comfortable enough to be occupied twelve months out of the year.

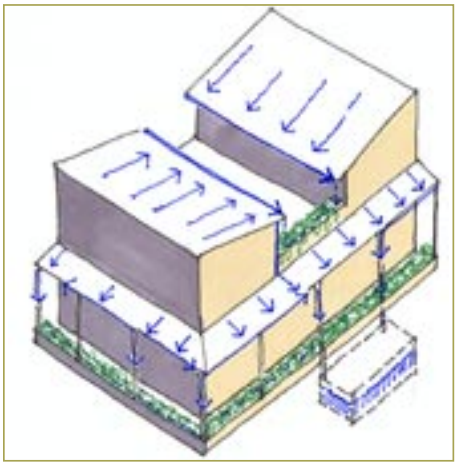


Figure 8.11- *Rainwater Collection (Portable).*

The pattern *Thin Plan* (Figure 8.13) deals with the building width in relation to the accessibility of natural

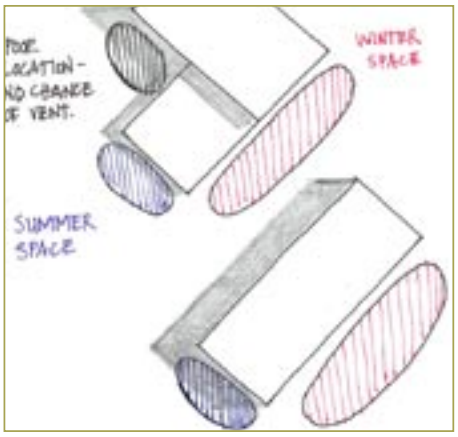


Figure 8.12- *Locating Outdoor Rooms (Portable).*

daylight. By limiting the width of a building, each room is ensured adequate natural daylight, with the central zone of the building possibly used for utility functions and/or circulation. Access to natural daylight has the potential to increase worker productivity, as well as create a connection between the occupant and the outside world. It is important to consider the quality of the daylight admitted when utilizing this pattern. Problems can result from direct glare on computer screens and too little contrast on the work surface is the light is admitted directly.

Thermal Collector Walls is a passive solar heating pattern dealing with the collection and distribution of captured solar heat. When using this stratgy, the surface on which the collectors are located is usually opaque, thus eliminating any visual connection to the exterior. This is not neccessarily a bad thing because such situations can provide privacy, eliminate unpleasant views, prohibit direct rays of light (which can be useful in museum and other settings with light sensitive materials), and/or help to focus a view to some other, more pleasant, exterior vista.

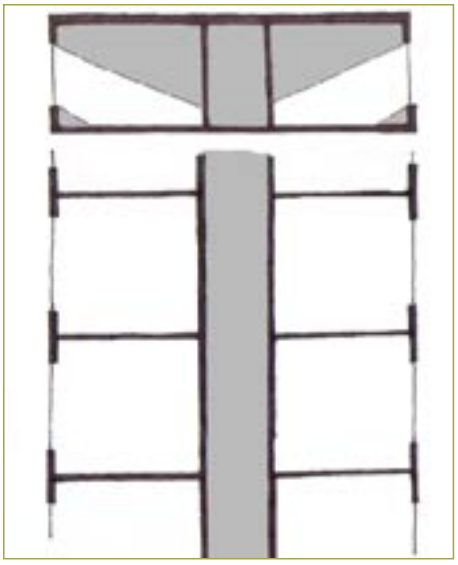


Figure 8.13- *Thin Plan (Portable).*

The pattern of *Combined Openings* (Figure 8.14) is similar to Responsive Roofs in that its intention is to have multiple uses for a single design element.

Figure 8.15 illustrates the pattern of *External Shade*. This pattern could be as simple as a single awning or as complex as a system of screens and trellises that effectively wrap a building. The benefits of utilizing this pattern are the blockage of direct sunlight into a space, thus reducing solar heat gain, and the activation of the space immediately around a building (assuming the external shade is for the first level),

thus creating a transition zone between the exterior and interior. By blocking the sun before it reaches a building's interior, the use of, and reliance upon, mechanical systems for cooling a building could be reduced.

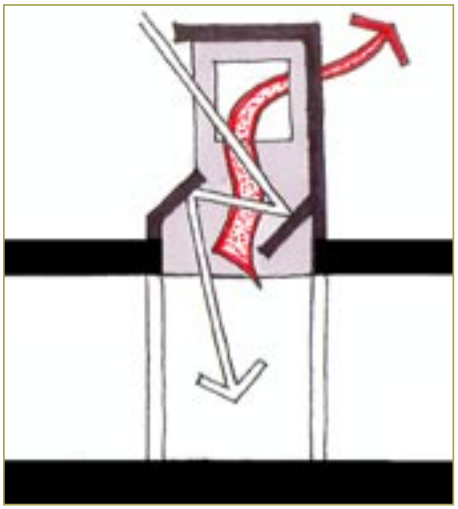


Figure 8.14- ***Combined Openings (Portable).***

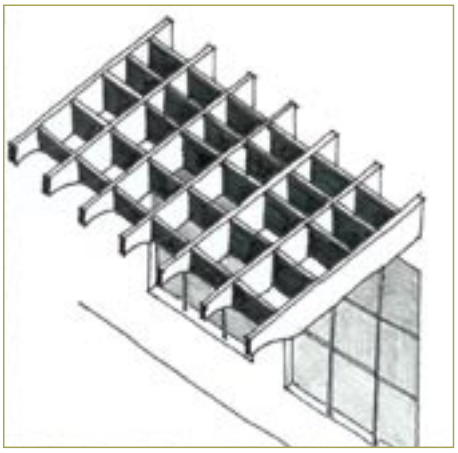


Figure 8.15- ***External Shade (Portable).***

CHAPTER 9 INTEGRATE

The final step in the Portable Process is perhaps the most important. All the information learned and relationships discovered now need to be integrated into a holistic design. The Pattern Map helps with this process due to the establishment of a hierarchy. This hierarchy, however, is not necessarily one based on importance, but a hierarchy based on scale. In order to achieve a holistic design, it is imperative to integrate the new with the existing, and it is more logical to begin with the broadest patterns to be utilized. However, this should not be interpreted to mean all urban scale patterns should be used and given equal importance. It is the responsibility of the architect to use judgement when ranking the patterns, and it should be based on program and project goals.

Program

Before discussing the integration of the patterns, the project's program needs to be discussed. *The University of Tennessee Outreach and Knowledge Preparation Center* is primarily a civic design studio that would be funded by the University of Tennessee. The work done in the design studios would be for the city of Knoxville and its day to day operations would be open to the public. Additionally, most work done in the design studios would be either pro bono work or for a minimal fee. Again, the purpose of the design studio is essentially furthering the education of the students, not to turn a profit. Figure B.1 gives a detailed analysis of the program.

Furthermore, the program relates to the thesis by its very nature. The knowledge a student gains during participation in the University's program will be used and furthered in the design center. This education could then be used by the

student once they move on and further their careers. Thus an education particular to the University of Tennessee would become portable as careers advance.

The Design Studios

Included in the Outreach and Knowledge Preparation program are four separate design studios. Each studio would work on a separate project, with their responsibilities being somewhat different. The Shared Design Center studio would be comprised of architecture students who are at a relatively early stage in their architectural education. The Design Center studio and the Research studio would be comprised of students in their final two years of their education. The Post-Graduate Design studio would consist of recently graduated students from the architecture program.

In addition to the design studios, there is also an auditorium, a public forum/charette space, and a conference room available for use by the public. All of these spaces could be used for a variety of purposes, thus are flexible in their design.

The Residential Component

The residential component of the program is comprised of short term and long term units. Their use would be for professors and lecturers who are visiting on behalf of the University. Therefore, the use of the residential units would not be limited to architectural professors and/or lecturers.

The Project

As mentioned earlier, once the site has been analyzed and possible design responses determined, it is necessary to give

Figure 9.1- *Design Issues to Address.*

priority to the more important patterns that will serve as the foundation for the remainder of the project design. Prior to this, however, the previously collected information should be evaluated for important issues to address. Based upon the site's location within the urban context, only the northern edge will be visible from Cumberland Avenue (Figure 9.1). Therefore, the most dominant portion of the design should be in this location. As stated earlier, a portion of this project is based upon the assumption that the surface lot to the east will be developed sometime in the near future. Therefore, an edge condition should be established on the eastern portion of the site to activate the sidewalks and provide infill for the existing hole in the urban fabric.

There should also be design moves that integrate and activate the proposed greenway trail as well as the proposed park extension. The site, therefore, should essentially be open to the west. Additionally, because the greenway trail will have a relatively uniform look and feel throughout, the development of thresholds for the site is imperative. These thresholds could take on a variety of looks, but should all be in the same family. Also, due to the differences within the program (public versus private), it would be ideal to have a buffer zone of some sort between the two. Finally, the residential zone of the project should have additional buffer zones on the south to provide privacy and peace.

Figure 9.2- *Interwoven Buildings and Plants & Dispersed Buildings (Particular).*

With these issues in mind, the combined patterns of *Interwoven Buildings and Plants* and *Dispersed Buildings* (Figure 9.2) were given top priority. Since the prevailing wind direction during the summer months is from the southwest, any landscape located southwest of the site will help to cool the incoming breezes. Using the proposed park extension, the site will benefit from the vegetation of the greenway due to

the cooling of the crossing wind. The pattern of Dispersed Buildings naturally followed since the incoming wind will need to filter through the site. A possible conflict, however, could arise between Dispersed Buildings and creating an edge to the east. A solution to this problem could incorporate the Permeable Buildings pattern. By allowing the lower level(s) to open up, and edge condition could still be established while allowing inlets and outlets for the crossing wind.

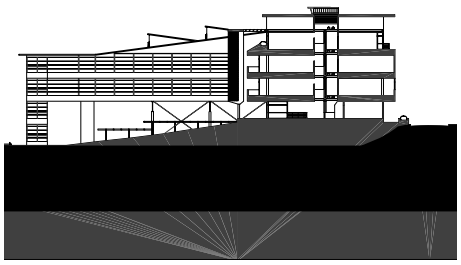


Figure 9.3- *Topographic Restoration (Particular).*

Perhaps the most challenging pattern to develop is *Topographic Restoration* (Figure 9.3). In preparation for the 1982 World's Fair Exposition, the original gentle slope that drained into Second Creek was cut to form the two existing surface parking lots. In terms of this pattern's priority, it must be near the top since it will establish the terrain on which the rest of the project will reside. The "shelves" were filled in and the courtyards are planted. By using softscape instead of paved terraces of some sort, the natural hydrology is restored.

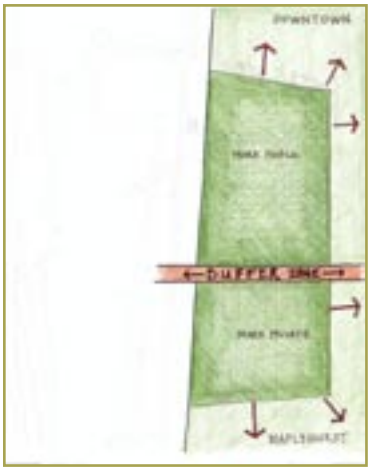


Figure 9.4- *Site Zoning Rationale.*

In terms of arranging the programmatic zones, the existing context was used as a guide to the thought process. Figure 9.4 illustrates the general zones of the project. The more public part of the program was placed on the N-NE side of the site. This area affords the most visibility, and has a scale more on the urban level As a result, the main building housing the more public program of the civic design center was placed on this area of the site. The primary circulation path intersecting the site serves as a necessary buffer zone between the two zones of the site, with the residential portion of the program placed on the S-SE side of the site. This move creates a strong connection to the existing residential zone of the Maplehurst neighborhood and is also quieter and more private. The Figure Ground (Figure C.1) also illustrates a similarity in building size

Figure 9.5- ***Courtyard Orientation.***

between the new and existing residential zones, as well as a similarity between the main building of the project and the non-residential buildings of the surrounding area.

To accommodate the necessity of the urban edge to the east and access to the urban green to the west, two courtyards were created that open to the west (Figure 9.5). The more public courtyard is larger and more inviting to the public while the more private courtyard in the residential zone is smaller and more intimate. Both courtyards offer access and vistas to the urban green, as well as to the areas beyond. As can be seen from the Shaded Roof Plan (Figure C.2), as well as Figure 9.6, both courtyards have adequate exposure to sunlight 12 months out of the year. During the winter months, this is an asset since the outdoor space is still able to be occupied. During the summer months, however, this is both a curse and a blessing. It is a curse because people will want to remain in the shade most of the time. It is a blessing because it creates the opportunity for migrational spaces (Figure 9.7). *Migration Spaces* cause individuals to become aware of the changing seasons of the year and thus the changing sun angles. The result is a stronger connection with the natural environment- a connection typical office buildings in this country neglect. The more public of the rooftop terraces, located on the northeast corner is a year round outdoor space. The high angle of the summer sun will be blocked, while the lower sun angles of the winter months will penetrate the space. The other rooftop terrace can also be considered a year-round space due to the vegetated trellis. This form of responsive shading will block most of the summer sun because the vines will be in bloom. The majority of the winter sun, however, will be admitted. The outdoor room on the ground level could also be considered a year round space, although its lower elevational location, in

Figure 9.6- ***Seasonal Shade- Summer and Winter.***

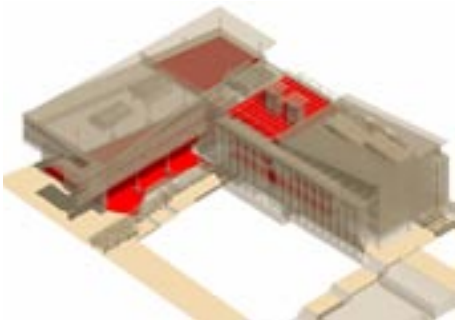


Figure 9.7- *Migration Spaces.*

relation to the walkway to the south, will block a good deal of the winter sun.

The relationship between the interior and the exterior can be seen in the Site Plan (Figure C.3). The east face of this level has few changes in its depth from the street and is activated by the overhang from the second level. Due to the rise in elevation as one moves from north to south, this overhang assumes a dynamic quality. Its height overhead ranges from twenty-one feet on the north to less than six feet on the south. On the courtyard side, the face of the building has deeper crenellations. Adjacent to the exhibition space, the distance from the edge of the overhang to the window face is twelve feet. On the south side of the first level, which has an elevation difference of twelve feet from the north side, the depth of the overhang is reduced to six feet. The deeper overhang helps to reduce the penetration of the afternoon sun into the lower exhibition space. This is desirable since the various projects of the design studios will be on display, and the space would be better served by task lighting.

In attempting to remain loyal to the site zoning guidelines, I arranged the remainder of the program so that the guidelines used to arrange the layouts of the buildings would essentially match those used in the arranging of the internal program. The auditorium, Park View Conference Room, and the public flex space are all located in the elevated portion of the main building, the northern most part of the building (Figure C.4). These spaces would be the most public and visible and could be used for public gatherings and the like. Additionally, the rooftop terrace on top of the elevated portion of the building is intended to be the more public of the two rooftop terraces and has the best view of the downtown area.

The central portion of the building houses the design studios, faculty offices, and the classrooms. The south side of levels two - four is where the utility zones are located- kitchen, storage, elevator, bathrooms, and fire stairs. The main reason for locating the utility zone in this location has to do with the southern exposure of that face of the building. Because the building is oriented more in the north-south direction, southern exposure is limited. To accommodate this situation, I placed a *Thermal Collector Wall* on the southern most face of the building. Using this means of solar collection means that visibility is eliminated to the south. This is not necessarily a bad situation though. The vistas of the urban green to the west remain in tact, and the residential units to the immediate south retain a certain level of privacy.

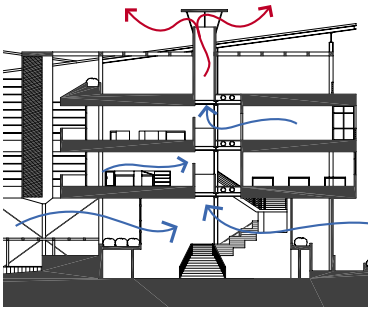


Figure 9.8- *Stack Ventilation (Particular).*

Referring back to the climatic chart for Knoxville, the wind speed in the urban center is not strong enough to effectively cross-ventilate a building. Although there would be times when wind speed would be strong enough to do so, I chose to utilize the passive cooling pattern of *Stack Ventilation* because this method of cooling does not rely on wind movement, but relies instead on the principle that heated air will rise. Due to the large area of spaces to be cooled, the area of the stack cross-section needed to also be relatively large. To integrate this fact into the design, I chose to use the central zone of each floor essentially as the cooling stack (Figure 9.8).

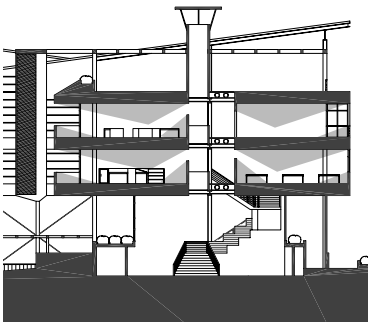


Figure 9.9- *Thin Plan (Particular).*

The central zone of the building is essentially a bridge, as can also be seen in Figures 9.8 and C.5. Due to this, it is logical to reserve this zone for circulation. Figure 9.9 illustrates how the design decision to locate the work spaces on the perimeter also allows for adequate natural daylight. Adhering to the rule-of-thumb for the maximum room depth (2.5 times the height of the window head), natural daylight would sufficiently cover

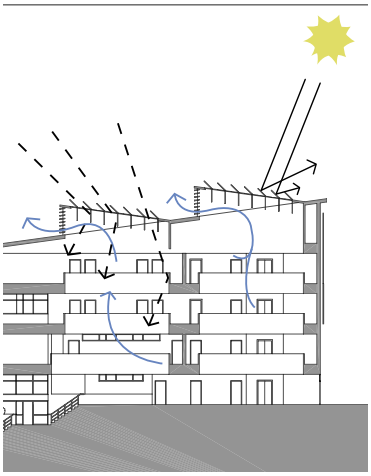


Figure 9.10- *Combined Openings (Particular).*

the work zones on both the east and west sides. However, when the exterior balconies were added on the west side of the building, the resulting overhang decreased the effective depth of daylight penetration. To accommodate this move, I chose to combine the stack ventilation chimneys with light wells (Figure 9.10). The stack outlets are located on the northern side of the roof aperture, while the aperture's roof is glazed. The bent louvers help to reflect northern light down into the light well, as well as shade the glazing from the sun. Blocking the sun before it enters the building will help to reduce heat gain.

This is also a logical move since the circulation zone was already intended to essentially be a bridge, thus relatively light and permeable. To accommodate light penetration down to the first level, I decided to use opaque structural panels for the flooring. The result of combining the ventilation stacks with light shafts is an interesting arrangement of solid and void that would have an ever changing visual appearance throughout the course of the daytime hours.

Figure 9.11- *External Shading (Particular).* *East Facade (top); West Facade (bottom).*

Another means of controlling the degree and depth of sunlight penetration is to use the pattern of *External Shade*. As stated earlier, this could entail a simple awning or trellis or it could be comprised of various shading elements. For this project, in keeping with the different faces of the east and west (public/private, shallow/deep), the decision was made to integrate different shading devices for the different faces of the building (Figure 9.11). On the east facade, the morning sun would be the biggest concern. Due to its relative low angle, horizontal shading would not suffice unless the louvers were unusually long. Also considered was the fact that the individual faculty offices are located on this

side- individual offices should have individual controls. As a result, operable insect screens (with a reasonably high shading coefficients) are used for both windows and balcony openings. When closed, adequate shading is achieved while some visibility is preserved.

For the courtyard facades, shading is achieved for the studios by the oversized, operable louvers. These would be controlled electronically and would follow the time of the day and the seasons of the year. The vegetated screens located on the western facade of the auditorium and above the entrance to the main lobby are basically vertical trellises, thus a form of responsive shading. The main difference are the view portals left open in select locations. These are used on the courtyard side of the building, as opposed to the more urban side, because of the open green space of the courtyards, as well as the proposed park extension through the lower lot.

Developing the pattern of *Responsive Roofs* is similar to External Shading in that the development can be relatively simple or very complex. It is important, however, to be careful when utilizing this pattern in a building complex to take care to ensure the roofs appear to be a part of the same family. This does not mean they have to be identical, but just that they should have obvious visible similarities. The purposes of a responsive roof are to create shelter from undesirable elements when appropriate (sun, wind, and rain) thus creating spaces for outdoor rooms, as well as to let these forces be felt when appropriate. Additionally, a responsive roof should assist in the channeling of rainwater for collection and reuse.

Knoxville has a reasonably high level of annual rainfall. When this is considered with the topography of the region, it becomes necessary to control the amount of runoff, especially

in urban settings. Having large amounts of softscape helps to accomplish this goal, as well as reduce the effects of urban heat islands. When planted areas are either not possible or large enough to have a significant impact, buildings can help reduce runoff by channeling rainwater to appropriately sized collection areas (Figure 9.12). Once collected, the water can be reused for the building's non-potable demands.

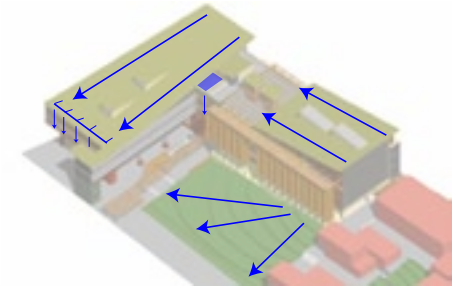


Figure 9.12- *Rainwater Collection (Particular).*

The patterns just described do not represent all the patterns developed in this project. The Pattern Map provides a more complete listing, although this too is not totally complete. More time and research would inevitably produce more patterns.

Additionally, the explanations of the project that were given in the descriptions of the particular patterns does not cover the entire scope of the project. Figure D.1 provides additional information in the form of a three-dimensional model.

CHAPTER 10 CONCLUSION

This thesis began as an investigation into the feasibility of an architecture that is both portable and particular. After discovering that it is possible for building typologies to satisfy this qualification, I was not satisfied and wanted something more. The evolution of the Portable Process was an ongoing and ever-changing process of discovery that is by no means complete. There will always be other directions to venture and more information to gather in an attempt to create a place-responsive design.

The most difficult obstacle I encountered after the Portable Process had been established was how to effectively integrate the numerous bits of information into a well-designed, holistic building. The final step of the process, "Integrate," is somewhat misleading. This action does not deal solely with the patterns identified and proposed, but also incorporates the designers knowledge of architecture, the past, present and future objective and subjective characteristics of a site, as well as a personal preference that may not mesh well with the project, but must be accounted for. Integration means being able to simultaneously be aware of elements at drastically different scales and know the relationship between them. It does not imply the use of a formula, but relies heavily on intuition. I am not claiming to have mastered this process during the course of this thesis, but I was made very aware of all that it entails how often it is written and read by most without the knowledge of its complexities and awesome potentials.

The revelation about the process of integration lead to other revelations concerning what I perceive to be the current state of architecture. There has been lots of literature published, especially within the past year, that calls for a more sustainable method of designing and building. The benefits of *integrating*

the built and natural environmetns have been tested and re-tested, published and re-published. It is my contention that although "green" design is picking up speed in today's society, the practice of creating a *holistic* architecture where a fitness is achieved between the occupant, the built environment and the natural environment is still lacking. The United States Green Building Council's Leadership in Energy and Environmental Design (LEED) Program, currently, deals only with sustainable design issues, i.e. objective issues. Although I believe LEED is a good first step in a better direction, it is not yet clear if it's current popularity is a genuine sign of a fundamental shift in thinking of the architectural profession or if it is simply a fad that will lose its momentum in the near future. If it is the later, this could imply that architects are designing by way of a checklist. Integration and fitness may not even be part of their vocabulary.

Tadao Ando's statement, quoted at the beginning of Chapter Five, states that the purpose of architecture is the creation of *place*. Kenneth Frampton said that the distinguishing characteristic of critical regionalism is its preference of *place* over space. Place is what emerges when fitness is achieved. It is possible to design a space and it still be only a space. It only becomes a place when the three parts of the architectural triangle are successfully integrated so that it has a feeling to it that the individual can identify with and feel comfortable in.

Whether or not this thesis achieved this fitness is difficult to know because it can only be experienced through drawings. Nonetheless, I still believe it to be a successful endeavor. I feel this because it addresses an important issue currently facing the architectural profession. The intention of the Portable Process is to offer a means of: identifying the memory and meaning inherent in every site, analyzing this information with

regards to the site's subjective and objective environments, and to then integrate these relationships in a way that results in an environmentally fit and ecologically considerate architecture.

BIBLIOGRAPHY / LIST OF REFERENCES

Abel, Chris. *Architecture and Identity* (Butterworth-Heinemann, 2000).

Ando, Tadao, "Toward New Horizons in Architecture," *Theorizing A New Agenda for Architecture: An Anthology of Architetural Theory*, ed. Kate Nesbitt (Princeton Architectural Press, New York, 1996).

Brown, G. Z. and Mark DeKay. *Sun, Wind and Light: Architectural Design Strategies* (New York: John Wiley and Sons, Inc., 2001)

Frampton, Kenneth, "Prospects For A Critical Regionalism," Nesbitt.

Frampton, Kenneth, "Place-Form and Cultural Identity," *Design After Modernism: Beyond the Object*, ed. John Thackara (New York, Thames and Hudson, 1988).

Frampton, Kenneth, "Universalism and/or Regionalism. Untimely Reflections on the Future of the New, *Daidalos*, issue 782, 1991.

Gauzin-Muller, Dominique. *Sustainable Architecture and Urbanism: Concepts, Technologies, Examples* (Boston: Birkhauser, 2002).

Guy, Simon, Graham Farmer, "Reinterpreting Sustainable Architecture: The Place of Technology," *Journal of Architectural Education*, 54/3, February 2001.

Heidegger, Martin, "Building, Dwelling, Thining," *Poetry, Language, Thought*, trans. Albert Hofstadter (Harper and Row, 1971).

Heschong, Lisa. *Thermal Delight In Architecture* (Cambridge: The M.I.T. Press, 1979).

Kelbaugh, Douglas. *Common Place, Toward Neighborhood and Regional Design* (Seattle, University of Washington Press, 1998).

Korzilius, Lester, "The Importance of Place In Architecture," (March 1996).

Norberg-Schulz, Christian. *Intentions In Architecture* (Cambridge: The M.I.T. Press, 1965).

Norberg-Schulz, Christian, "The Phenomenon of Place," Nesbitt.

Olgay, Victor. *Design With Climate: A Bioregional Approach to Architectural Regionalism*, ed. Van Nostrand Reinhold (New York, 1992).

Sale, Kirkatrick. *Dwellers In The Land: The Bioregional Vision* (San Francisco: Sierra Club Books,1985)

Tanizaki, Jun'ichiro. *In Praise Of Shadows* (New Haven: Leete's Island Books, Inc., 1977).

The European Commission…[et al.]. *A Green Vitruvius: Principles and Practice of Sustainable Architectural Design* (London: James and James, 1999).

Thiis-Evensen. *Archetypes In Architecture* (Oxford: Oxford University Press, 1987).

Tzonis, Alexander, "Critical Regionalism: An Attitude, Not A Style," *Architecture of Israel*, issue 19, 1994.

Tzonis, Alexander, and Liane Lefaivre, Tropical Architecture: Critical Regionalism in the Age of Globalization, ed. Alexander Tzonis, Liane Lefaivre, and Bruno Stagno (Wiley Academy, England, 2001).

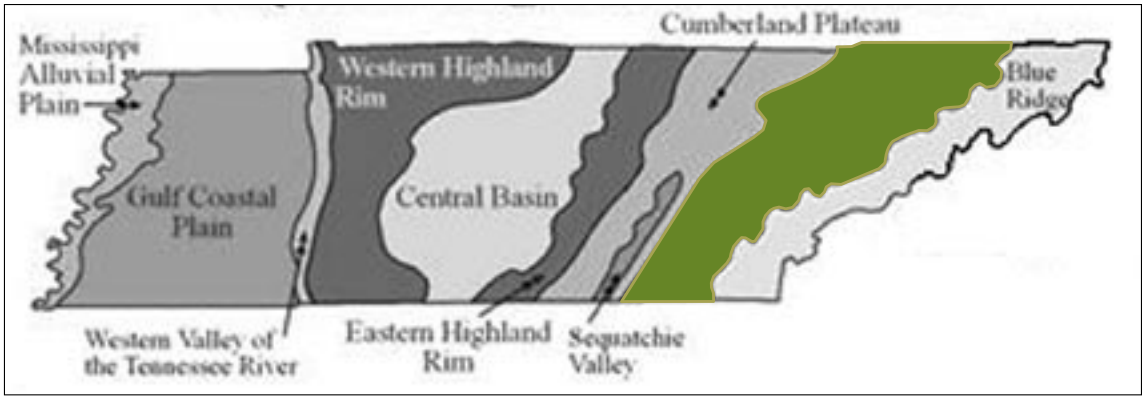
Tzonis, Alexander, and Liane Lefaivre, "Why Critical Regionalism Today?" Nesbitt.

Van der Ryan, Sim, and Stuart Cowan. *Ecological Design* (Washington: Island Press, 1996)

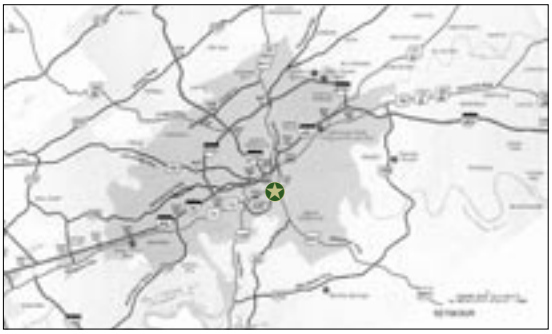
APPENDICES

APPENDIX A- SITE DOCUMENTATION

The Appalachian Zone- Knoxville, TN Indicated



The Physical Regions of Tennessee- Valley and Ridge Region Indicated



The City of Knoxville- Location of Site Indicated

The Surrounding Areas of the Site- Location of Site Indicated

Figure A.1- *Locational Maps.*

View of Lower Lot Looking From the Entrance Down to the Creek Patio.

View of the Second Creek Patio from the North Entrance.

View Down the Railroad Tracks (Looking South).

View of Stairs Leading from Lower to Upper Lot.

View of the Second Creek Patio from the South Entrance.

Sign Posted Concerning Second Creek.

View From Top of Stairs Leading from UT Campus to Creek Patio.

View from Southern Edge of the Upper Lot.

Figure A.2- ***Site Documentation.***

APPENDIX B- PROGRAM

Research Space		
Faculty Offices (4 @ 200 sq.ft each)	800	
Flex Conference/Work Room	400	
Research Assistants Workstations (10 @ 90 sq.ft each)	900	
Circulation (20%)	420	
		2,520 sq. ft.
Design Center		
Flex Meeting/Classroom/Charette Space	1000	
Work Studio (6 Drafting Positions, 3 Staff Offices, Director's Office)	1200	
Circulation (20%)	400	
Conference Room	200	
		2,800 sq. ft.
Shared Design Center/Teaching Space		
Urban Design Teaching Studio, including pin-up (16 @ 80 sq.ft)	1280	
Classrooms (2 @ 830 sq.ft each)	1660	
Circulation (20%)	560	
		3,500 sq. ft.
Post-Graduate Program Space		
Faculty Offices (2 @ 200 sq.ft each)	400	
Grad Student Offices/Studios, including pin-up (15 @ 90 sq.ft)	1350	
Circulation (20%)	350	
		2,100 sq. ft.
General Spaces		
Auditorium/Park View Conference Room/City View	13225	
		13,225 sq. ft.
Utility Spaces		
First Floor	3790	
Reception/Exhibit Space		
Storage		
Copy/Plot/Mail		
Restrooms		
Second Floor	1870	
		5,660 sq. ft.
Living Quarters		
Short-Term Units (8 @ 800 sq.ft each)	6400	
Long-Term Units (7 @ 1200)	8400	
General Space	1700	
Commons (600)		
Laundry (300)		
Office (300)		
Storage (500)	+	
		16,500 sq. ft.
TOTAL INDOOR SPACES		**40,645 sq. ft.**
TOTAL OUTDOOR SPACE		**26,000 sq. ft.**
GRAND TOTAL		**66,645 sq. ft.**

Figure B.1- ***Program.***

APPENDIX C- ARCHITECTURAL DRAWINGS

Figure C.1- *The Figure Ground.* *This drawing shows the similarities between the existing residential building size and placement of the Maplehurst neighborhood and the proposed residential units. Additionally, the main building of the project also bears a resemblance to the existing non-residential buildings by adhering to thin slabs oriented at right angles.*

Figure C.2- ***The Shaded Roof Plan*****.**

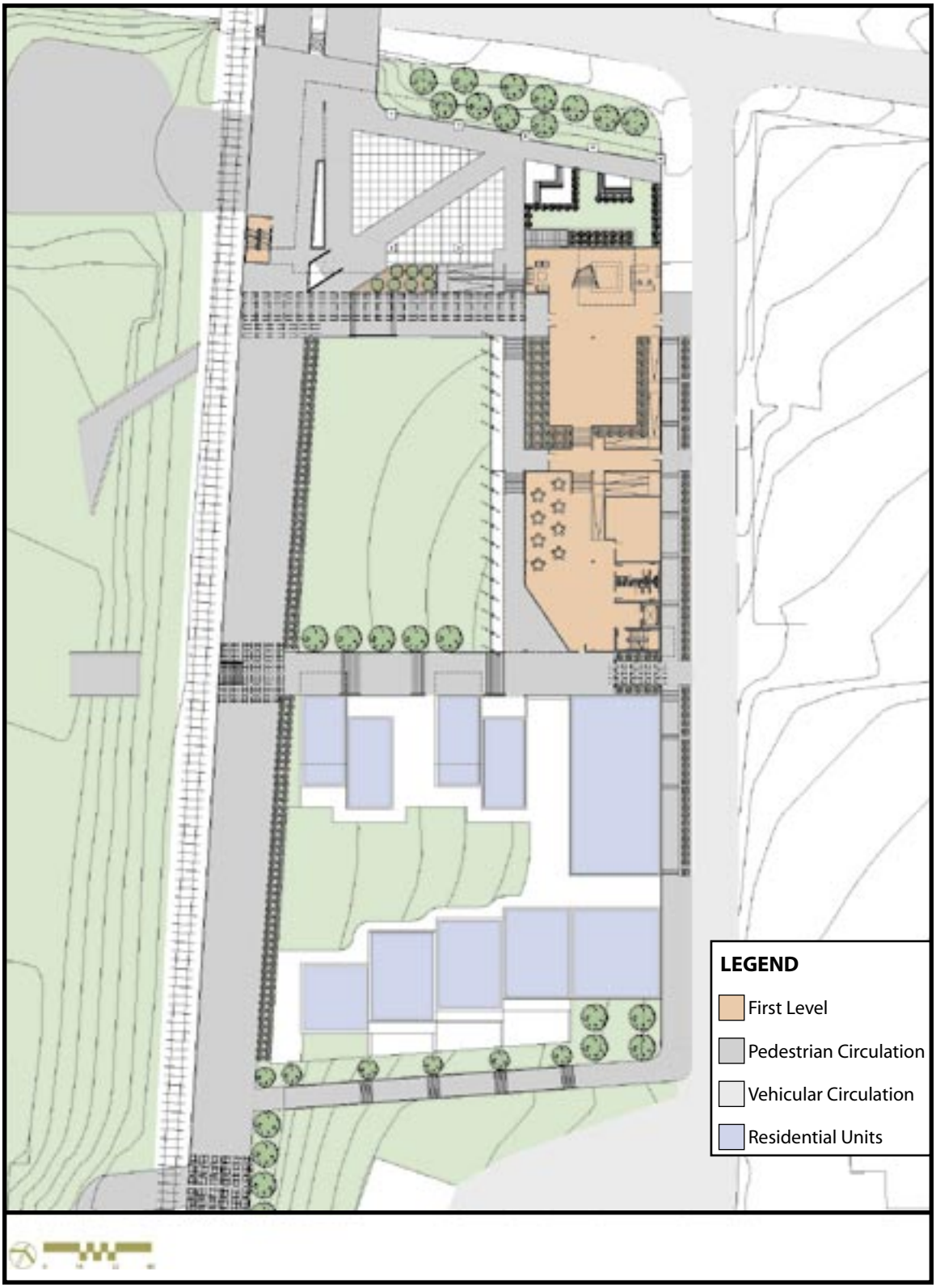


Figure C.3- ***The Site Plan.*** *This drawing reveals the lower level of the northern part of the building as being open. This was done to create an outdoor room similar to the indoor room located above.*

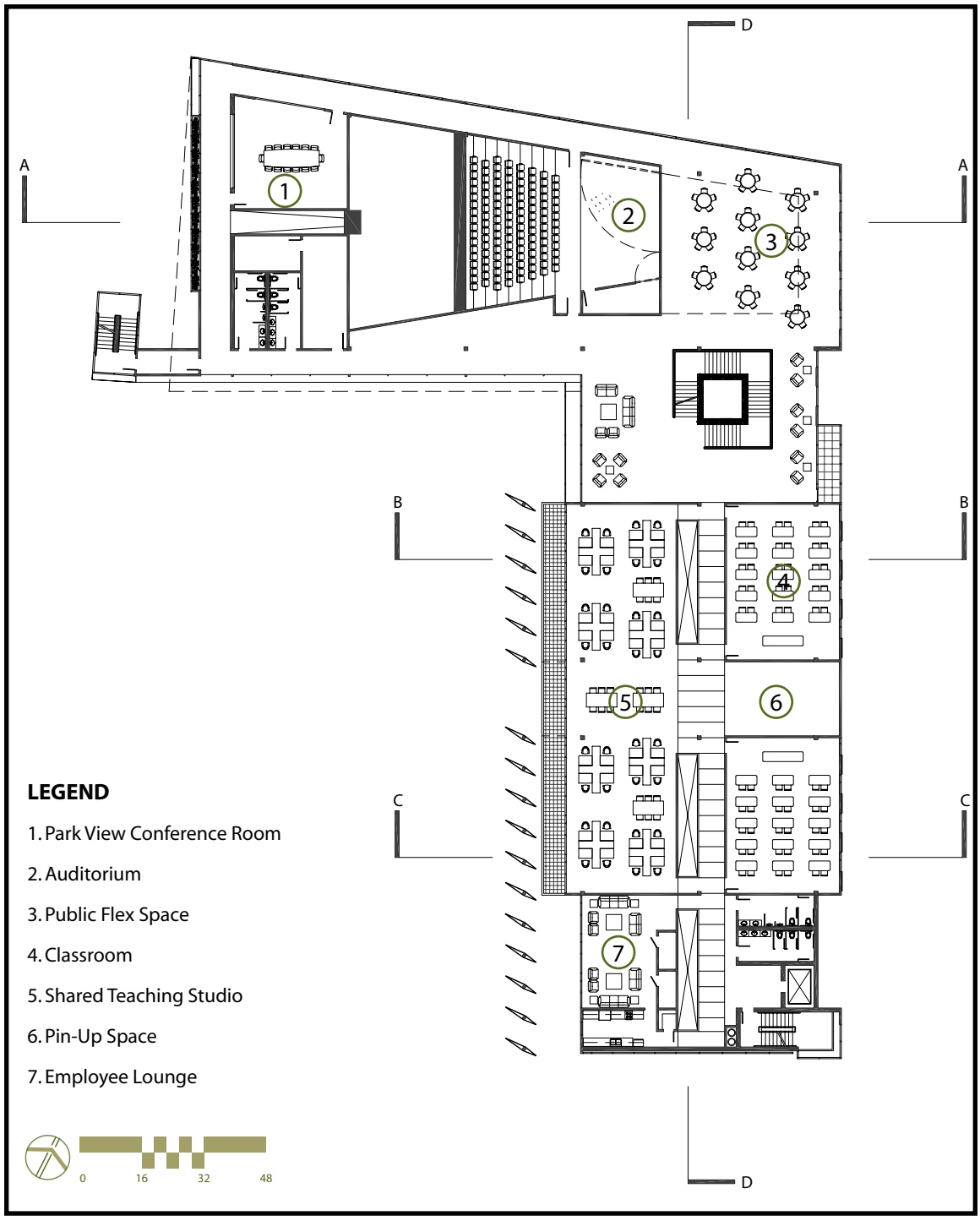


Figure C.4- ***Second Floor Plan.***

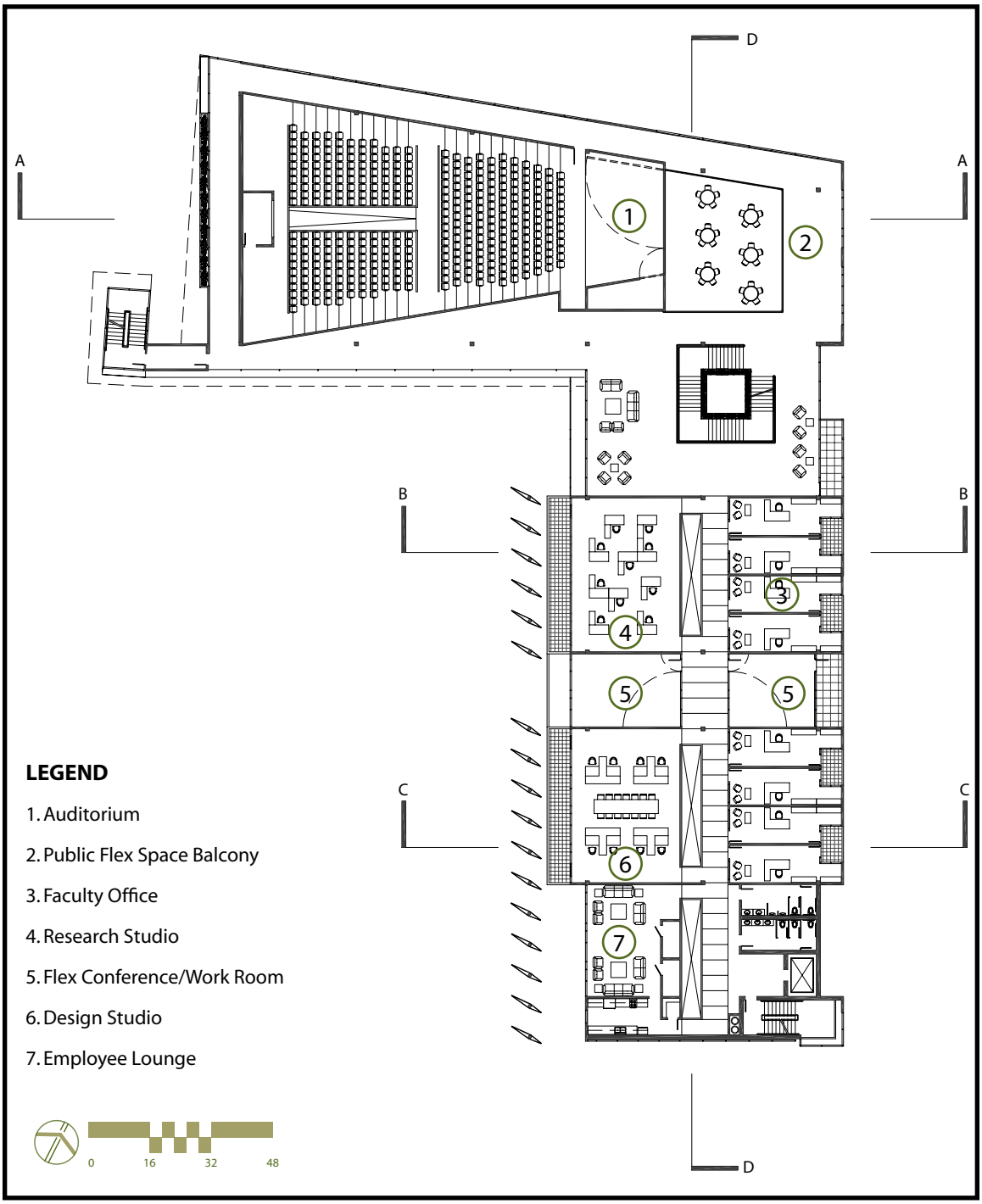


Figure C.5- ***Third Floor Plan.***

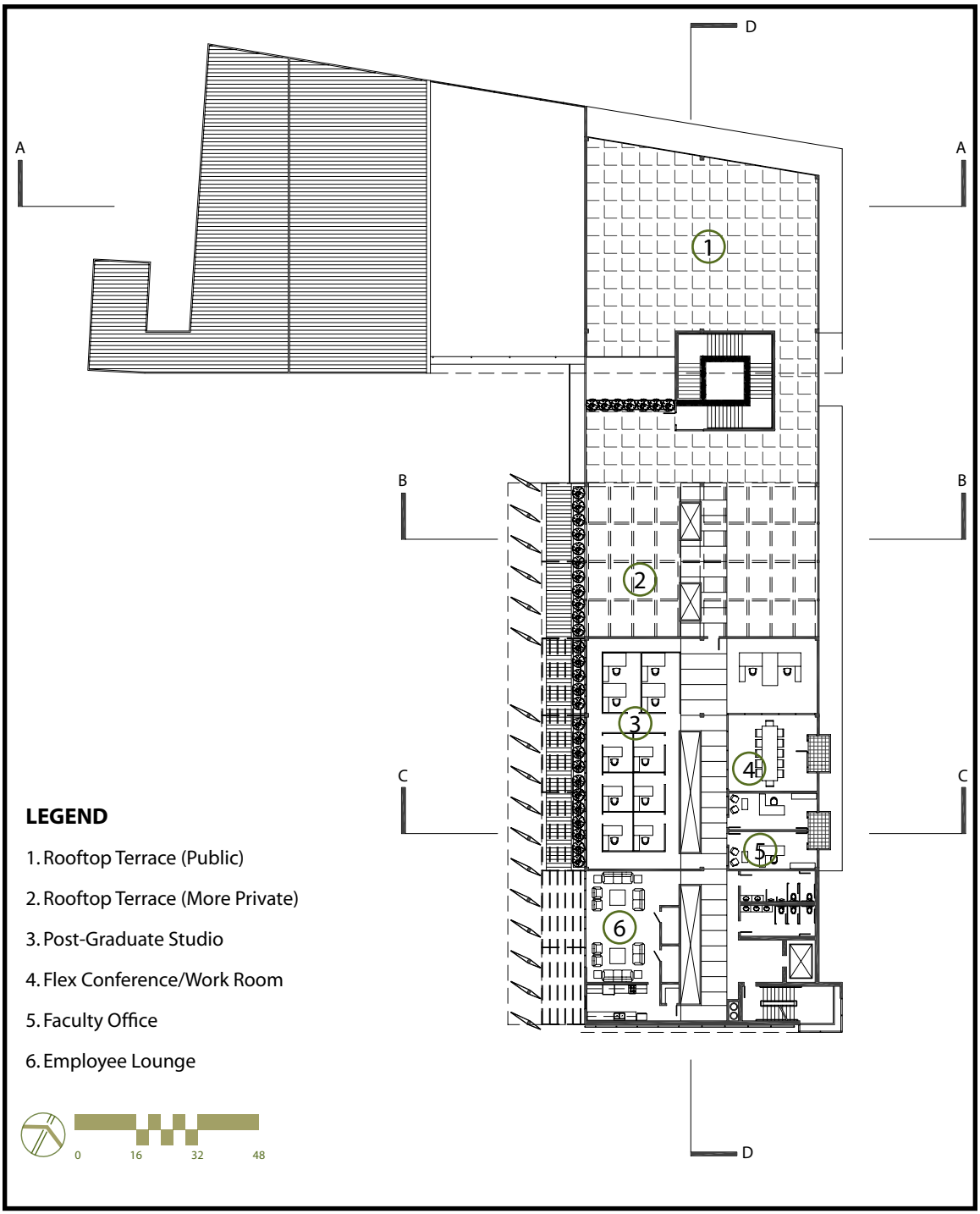


Figure C.6- ***Fourth Floor Plan.***

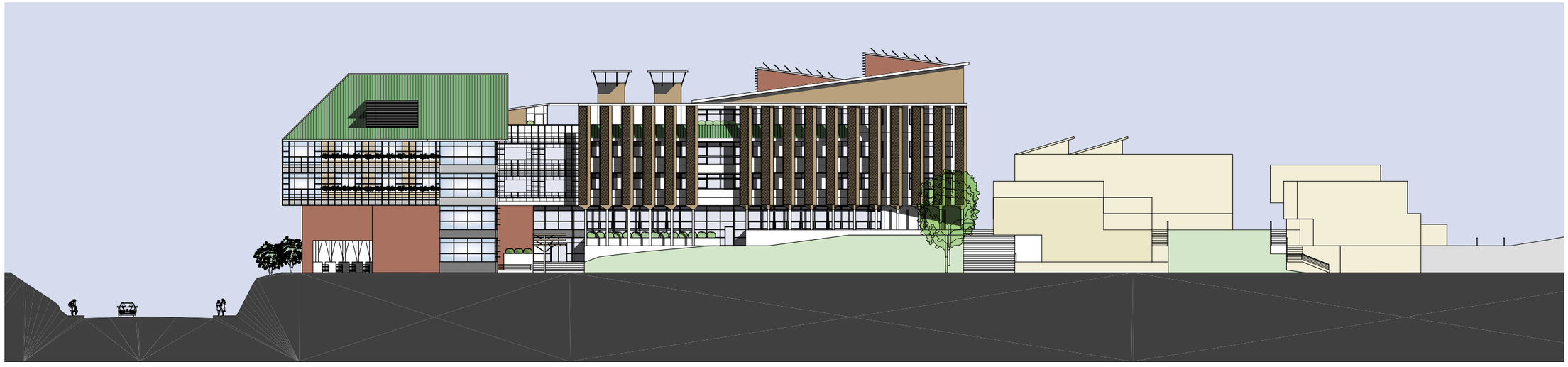


Figure C.7 - *Elevations.* East (top); West (bottom).

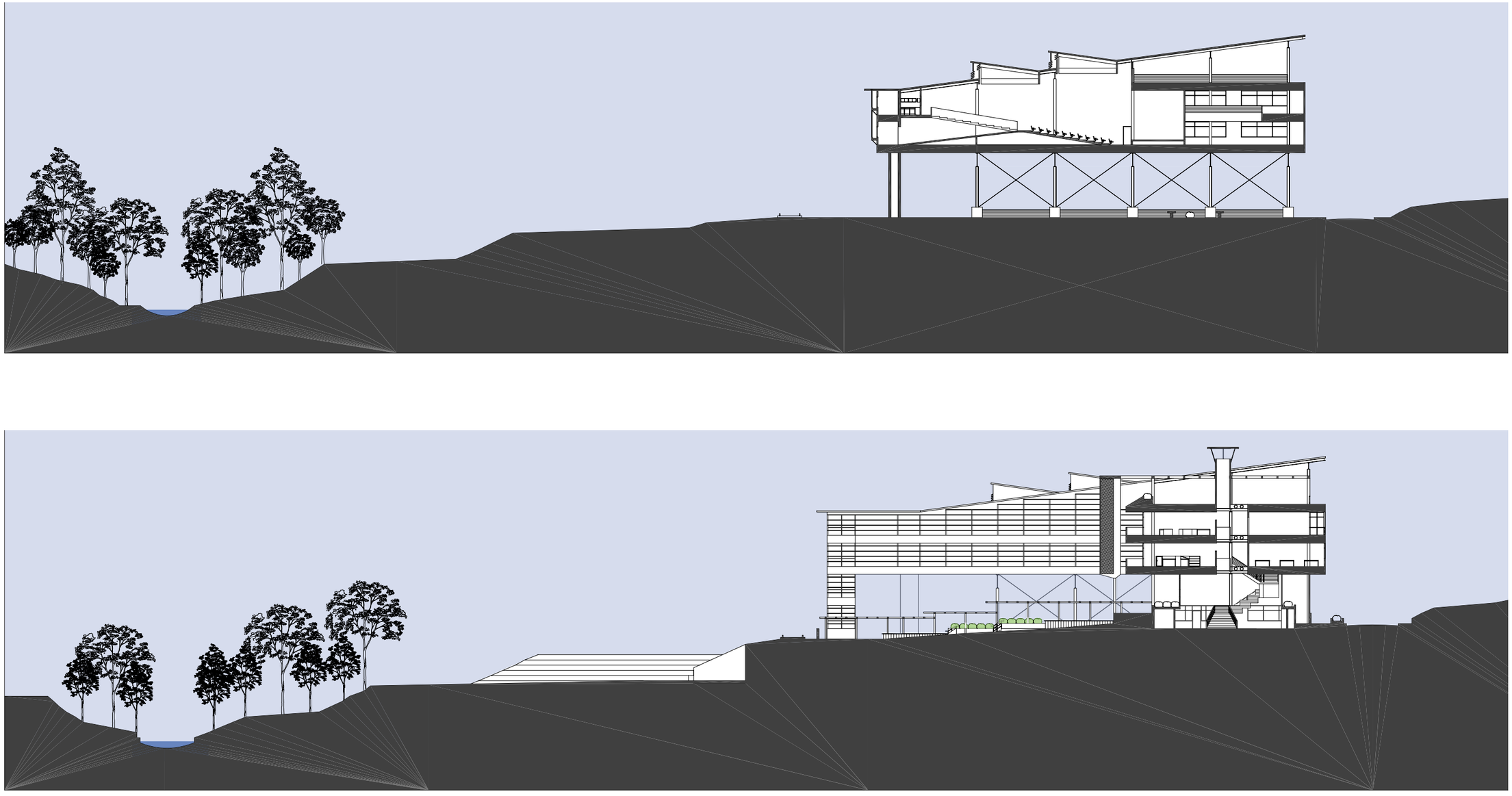


Figure C.8 - *Sections.* Section AA (top); Section BB (bottom).

0 16 32 48

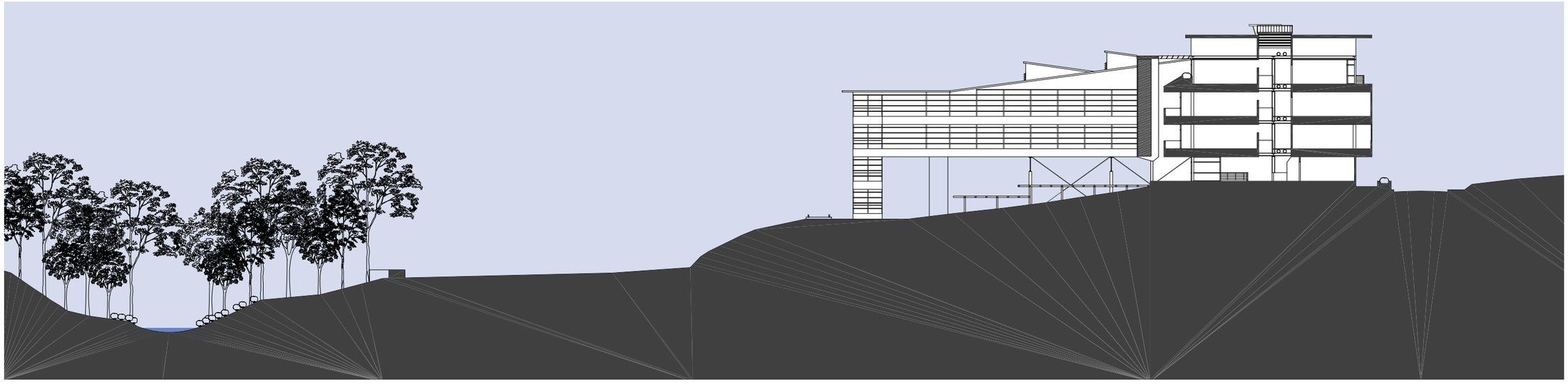
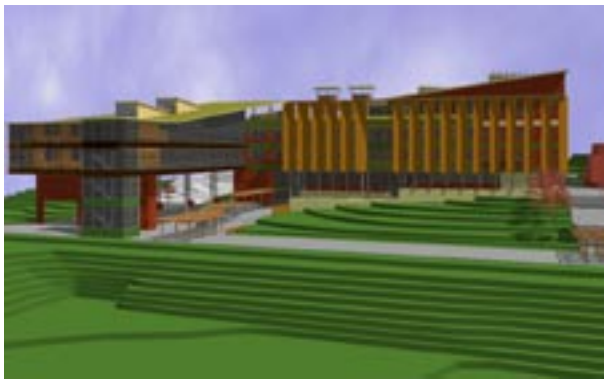


Figure C.8 - *Sections, Continued.* Section CC (top), Section DD (bottom).

0 16 32 48

APPENDIX D- RENDERINGS



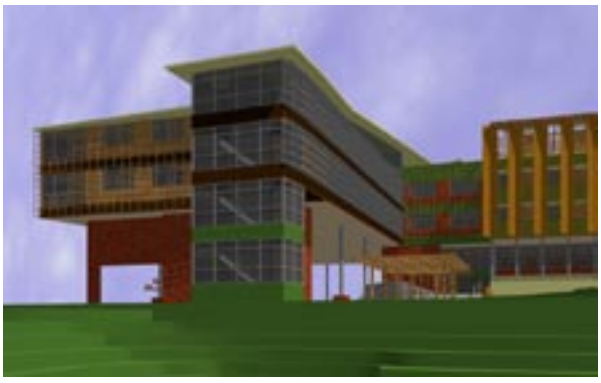


Figure D.1- ***3-D Renderings.***

VITA

Arthur Paul Butts was born in Fulton, KY on July 15, 1976. He also grew up in this rural western Kentucky town while attending elementary and junior high school at Carr Elementary. He spent his high school days at Fulton High School where he graduated in 1995 with valedictorian honors. From there, he attended Rhodes College in Memphis, TN and received his Bachelor of Art in Political Science, with a minor in Urban Studies.

Paul received his Master of Architecture degree from the University of Tennessee, Knoxville in the summer of 2004. During his studies, he was a two-time recipient of the Alma and Hal Regan Scholarship, as well as received the School of Architecture Scholarship and the AIA Scholarhship. He culminated his time in Knoxville as co-winner of the Henry Adams Bronze Medal.